FIRSTCARBONSOLUTIONS™

# DRAFT
# Subsequent Environmental Impact Report
# Spotorno Ranch Project
# City of Pleasanton, Alameda County, California

## State Clearinghouse Number 2017042032

## EXECUTIVE SUMMARY


Prepared for:
**City of Pleasanton**
Community Development Department
200 Old Bernal Avenue
PO Box 520, Pleasanton, CA 94566
925.931.5615

Contact: Jenny Soo, Associate Planner

Prepared by:
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
925.357.2562

Contact: Mary Bean, Project Director
Elizabeth Johnson, Project Manager


Date: July 16, 2018

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# EXECUTIVE SUMMARY

## Purpose

This Draft Subsequent Environmental Impact Report (Draft SEIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Spotorno Ranch Project (State Clearinghouse No. 2017042032). This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.).

The purpose of this Draft SEIR is to inform decision-makers, representatives of affected and responsible agencies, the public, and other interested parties of the potential environmental effects that may result from implementation of the proposed project. This Draft SEIR describes potential impacts relating to a wide variety of environmental issues and methods by which these impacts can be mitigated or avoided.

## Project Summary

### Project Location

The project is located in the southern portion of the City of Pleasanton. The approximately 154.7-acre site is bounded by Alisal Street to the west, Westbridge Lane to the south, residential homes to the north, and open space to the east.

### Project Description

The proposed Spotorno Ranch project (project) consists of development of 39 single-family residences on an approximately 154-acre site in the southern portion of the City of Pleasanton.

The project site is made up of Lot 97 (43 acres) and Lot 98 (111 acres) of the HVSP (see Exhibit 2-14 in Section 2, Project Description). The proposed residences would be constructed on an approximately 31-acre portion of Lot 98; the remaining 80 acres would be zoned Planned Unit Development-Agriculture-Open Space (PUD-A/OS) and the applicant proposes to record a conservation easement over this acreage. In addition, the project includes an amendment to the HVSP to change the residential density of the development site from Planned Unit Development-Semi-Rural Residential (PUD-SRDR) to Planned Unit Development-Low Density Residential (PUD-LDR). An amendment to the HVSP to eliminate the proposed Bypass Road included as part of the HVSP circulation plan, is also proposed.

On Lot 97, the approximately 15 acres designated by the HVSP for Planned Unit Development—Medium Density Residential (PUD-MDR) would be changed to Planned Unit Development-Agriculture/Open Space (PUD-A/OS) (see Exhibits 2-14 and 2-15 in Section 2.0, Project Description). The remaining acreage in Lot 97 would maintain its PUD-A/OS zoning. The Spotorno Family would retain the entirety of Lot 97.

All homes would be developed to the standards established in the HVSP. Full project buildout would result in the development of roadway improvements, trails, landscaping, and bio retention facilities.

### Project Objectives

The objectives of the proposed project are to:

- Create a high-quality, single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped open space with adequate publicly accessible connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent Measures PP and QQ.[1]

## Significant Unavoidable Adverse Impacts

The proposed project would not result in significant unavoidable impacts.

## Summary of Project Alternatives

Below is a summary of the alternatives to the proposed project considered in Section 5, Alternatives to the proposed project.

### No Project/No Build Alternative

Under the No Project/No Build Alternative the proposed project would not be constructed and the project site would remain vacant. No new housing, roads, or trails would be developed on the approximately 154-acre site.

### 22 Lot Development on Spotorno Flat Area Alternative

Under this alternative, the project would develop 22 residential units, instead of 39, on the Spotorno Flat Area portion of the project site. The bypass road would not be constructed. Other aspects of this alternative are described in more detail in Section 5, Alternatives.

### 39 Units With Construction of the Bypass Road Alternative

Under this alternative, the project would develop 39 residential units on the Spotorno Flat Area portion of the site and construct a bypass road using the alignment approved by the City in 2007. The bypass road would be constructed to link Westbridge Lane and Sycamore Creek Lane. Other aspects of this alternative are described in more detail in Section 5, Alternatives.

[1] As stated above, the project would include both a General Plan Amendment and amendment to the HVSP. The transportation improvements and residential developments would conform with the HVSP and subsequent Measures PP and QQ, assuming approval of these amendments.

## Areas of Controversy

Pursuant to CEQA Guidelines Section 15123(b), a summary section must address areas of controversy known to the lead agency, including issues raised by agencies and the public, and it must also address issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects.

A Notice of Preparation (NOP) for the proposed project was issued on Friday, April 7, 2017. The NOP describing the original concept for the project and issues to be addressed in the SEIR was distributed to the State Clearinghouse, responsible agencies, and other interested parties for a 30-day public review period extending from April 7, 2017 through May 8, 2017. The NOP identified the potential for significant impacts on the environment related to the following topical areas:

- Aesthetics, Light, and Glare
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Public Services and Recreation
- Transportation
- Utilities and Service Systems
- Mandatory Findings of Significance

### Disagreement Among Experts

This Draft SEIR contains substantial evidence to support all the conclusions presented herein. It is possible that there will be disagreement among various parties regarding these conclusions, although the City of Pleasanton is not aware of any disputed conclusions at the time of this writing. Both the CEQA Guidelines and case law clearly provide the standards for treating disagreement among experts. Where evidence and opinions conflict on an issue concerning the environment, and the lead agency knows of these controversies in advance, the SEIR must acknowledge the controversies, summarize the conflicting opinions of the experts, and include sufficient information to allow the public and decision makers to make an informed judgment about the environmental consequences of the proposed project.

### Potentially Controversial Issues

Below is a list of potentially controversial issues that may be raised during the public review and hearing process of this Draft SEIR:

- Transportation and Traffic
- Land Use
- Aesthetics and Visual Resources
- Cumulative Effects

It is also possible that evidence will be presented during the 45-day, statutory Draft SEIR public review period that may create disagreement. Decision-makers would consider this evidence during the public hearing process.

In rendering a decision on a project where there is disagreement among experts, the decision-makers are not obligated to select the most environmentally preferable viewpoint. Decision-makers are vested with the ability to choose whatever viewpoint is preferable and need not resolve a dispute among experts. In their proceedings, decision-makers must consider comments received concerning the adequacy of the Draft SEIR and address any objections raised in these comments. However, decision-makers are not obligated to follow any directives, recommendations, or suggestions presented in comments on the Draft SEIR, and can certify the Final SEIR without needing to resolve disagreements among experts.

## Public Review of the Draft SEIR

Upon completion of the Draft SEIR, the City of Pleasanton filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft SEIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the Draft SEIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft SEIR, including the technical appendices, is available for review at the City of Pleasanton offices and the City of Pleasanton Library. The address for each location is provided below.

City of Pleasanton—Planning Division
Monday through Friday, 8 a.m.–5 p.m.
City of Pleasanton
200 Old Bernal Avenue
Pleasanton, CA 94566

City of Pleasanton, Library
400 Old Bernal Avenue
Pleasanton, CA 94566
Hours: Monday–Thursday, 10:00 a.m.-9:00 p.m.
Friday–Saturday, 10:00 a.m.-5:00 p.m.
Sunday, 1:00 p.m.-5:00 p.m.

Agencies, organizations, and interested parties have the opportunity to comment on the Draft SEIR during the 45-day public review period. Written comments on this Draft SEIR should be addressed to:

Jenny Soo, Associate Planner
City of Pleasanton
Community Development Department
200 Old Bernal Avenue
PO Box 520
Pleasanton, CA 94566
Email: jsoo@cityofpleasantonca.gov

Submittal of electronic comments in Microsoft Word or Adobe PDF format is encouraged. Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review by the commenting agencies at least 10 days prior to the public hearing before the City of Pleasanton on the project, at which the certification of the Final SEIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by decision makers for the project.

## Executive Summary Matrix

Table ES-1 summarizes the impacts, mitigation measures, and resulting level of significance after mitigation for the relevant environmental issue areas evaluated for the proposed project. The table is intended to provide an overview; narrative discussions for the issue areas are included in the corresponding section of this SEIR. Table ES-1 is included in the SEIR as required by CEQA Guidelines Section 15123(b)(1).

Applicable Mitigation Measures from the Happy Valley Specific Plan FEIR are listed in Appendix J.

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## Table ES-1: Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Section 3.1—Aesthetics, Light, and Glare** | | |
| **Impact AES-1:** The project would not have a substantial adverse effect on a scenic vista. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-2:** The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-3:** The project would not substantially degrade the existing visual character or quality of the site and its surroundings. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-4:** The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.2—Air Quality** | | |
| **Impact AIR-1:** The project would not conflict with or obstruct implementation of the applicable air quality plan. | Implement MM AIR-2 and MM AIR-4. | Less than significant impact. |
| **Impact AIR-2:** The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. | *Short-term Impacts*<br>**MM AIR-2:** During construction, the following air pollution control measures shall be implemented:<br>• Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or more as needed.<br>• All haul trucks transporting soil, sand, or other loose material off-site shall be covered<br>• All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.<br>• All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour.<br>• All roadways, driveways, and sidewalks shall be paved as soon as possible. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.<br>• All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.<br>• A publicly visible sign shall be posted with the telephone number and person to contact both at the City of Pleasanton and at the office of the General Contractor regarding dust complaints. This person shall respond and take corrective action within 2 business days of a complaint or issue notification. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.<br><br>*Long-term impacts*<br>No mitigation is necessary. | |
| **Impact AIR-3:** The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). | *Short-term impacts*<br>Implement MM AIR-2.<br><br>*Long-term impacts*<br>No mitigation is necessary. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |
| **Impact AIR-4:** The project would not expose sensitive receptors to substantial pollutant concentrations. | *Short-term impacts*<br>Implement MM AIR-2 and the following:<br>**MM AIR-4:** The developer or project applicant shall ensure all off-road construction equipment in excess of 50 horsepower used on-site by the developer or contractors is equipped with engines meeting the EPA Tier III off-road engine emission standards. The construction contractor shall maintain a log of equipment use at the construction site with make, model, serial number, and certification level of each piece of construction equipment that will be available for review by the City's building inspection staff. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | *Long-term impacts*<br>No mitigation is necessary. | |
| **Impact AIR-5:** The project would not create objectionable odors affecting a substantial number of people. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Section 3.3—Biological Resources** | | |
| **Impact BIO-1:** The proposed project may have a substantial adverse impact on special-status plant and wildlife species. | **MM BIO-1a: Focused surveys for Congdon's tar plant and big tarplant**<br>A. LOA shall conduct focused surveys for the abovementioned species during the summer of 2018. If the focused surveys confirm that these species are absent from the impacted areas of the site, then mitigation would not be required. If the focused surveys confirm that these species are present in the impacted areas of the site, then the following measures shall be implemented to ensure that impacts are reduced to a less than significant level:<br>B. In consultation with a qualified botanist or plant ecologist, and to the maximum extent feasible, the project will be designed to avoid substantial direct and indirect impacts to these species. If the project cannot be designed to avoid significant impacts to these plant species, then the following compensatory measures will be implemented:<br>C. On-site preservation—The on-site proposed open space area should be surveyed during the appropriate blooming season to determine whether populations of the species being significantly impacted by the project are also present within areas that will be preserved. If populations of the species are present on the preservation area, it should be determined by a qualified botanist or plant ecologist whether these populations to be preserved would adequately compensate, or partially compensate, for lost populations on the project site. If it is determined that preserved populations would completely compensate for impacted populations, then no further compensation would be required. However, if it is determined that populations of the impacted species are absent from the site, or that they are present but their preservation would only partially mitigate for lost populations, then additional mitigation measures described below will be implemented. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | D. Off-site mitigation—Mitigation for impacted plant species could be accommodated through restoration or preservation at an off-site location. The mitigation site must be confirmed to support populations of the impacted species and must be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar preservation mechanism. A qualified botanist or plant ecologist should prepare a Preservation Plan for the site containing at a minimum the following elements:<br>• A monitoring plan and performance criteria for the preserved plant population<br>• A description of remedial measures to be performed in the event that performance criteria are not met<br>• A description of maintenance activities to be conducted on the site, including weed control, trash removal, irrigation, and control of herbivory by livestock and wildlife<br>E. The project applicant will be responsible for funding the development and implementation of any on-site or off-site preservation plan<br><br>**MM BIO-1b: California tiger salamander (CTS)**<br>As stated in section 3.3.2, CTS have been formerly documented breeding in ponds within 1.5 miles of the project site. Because of the prior presence of CTS within 1.5 miles of the project site, the following mitigation measures are recommended.<br>A. A qualified biologist will conduct preconstruction surveys prior to ground breaking activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site by a qualified biologist.<br>B. Prior to the start of construction, a qualified biologist will train all construction personnel regarding habitat sensitivity, identification of special status species potentially occurring on the site, and required practices. A representative shall be appointed by the applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a CTS or who finds a dead, injured or entrapped individual. The representative shall be identified during the | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | tailgate/training session. The representative's name and telephone number shall be provided to the Service prior to the initiation of ground disturbance activities.<br>C. A Service-approved biologist should be present for ground disturbing activities. The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CTS from moving into these areas. Construction activities should be limited to the period from May 1 through October 31.<br>D. Because dusk and dawn are often the times when CTS are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Construction personnel will inspect open trenches in the morning and evening for trapped amphibians. No canine or feline pets or firearms (except for federal, state, or local law enforcement officers and security personnel) shall be permitted at the project site to avoid harassment, killing, or injuring of CTS.<br>E. To minimize harm or mortality to individual CTS during migration movements, a maximum speed limit of 10 mph for vehicle traffic on the project site during both construction and operation phases will be enforced.<br><br>**MM BIO-1c: Burrowing owl**<br>A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified biologist to conduct a preconstruction survey on the project site. The survey shall establish the presence or absence of western burrowing owl and/or habitat features, and evaluate use by owls in accordance with CDFW survey guidelines.<br>B. On the parcel where the activity is proposed, the biologist shall survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership need not be surveyed. The survey shall take place near the sunrise or sunset in accordance with CDFW guidelines. All burrows or burrowing owls shall be identified and mapped. During the breeding season (February 1–August 31), | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | surveys shall document whether burrowing owls are nesting on or directly adjacent to disturbance areas. During the non-breeding season (September 1–January 31), surveys shall document whether burrowing owls are using habitat on or directly adjacent to any disturbance area. Survey results will be valid only for the season during which the survey is conducted.<br>C. If burrowing owls are not discovered, further mitigation is not required. If burrowing owls are observed during the pre-construction surveys, the applicant shall perform the following measures to limit the impact on the burrowing owls:<br>1. Avoidance shall include establishment of a 160-foot non-disturbance buffer zone. Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation, or that the juveniles from the occupied burrows have fledged. During the non-breeding season (September 1–January 31), the project proponent shall avoid the owls and the burrows they are using, if possible. Avoidance shall include the establishment of a 160-foot non-disturbance buffer zone.<br>2. If it is not possible to avoid occupied burrows, passive relocation shall be implemented. Owls shall be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors shall be in place for 48 hours prior to excavation. The project area shall be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent re-occupation. Plastic tubing or a similar structure shall be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.<br>**MM BIO-1d: American badger**<br>A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified wildlife biologist to conduct a focused survey for the American badger to determine presence or absence of this species within a 300-foot radius of the disturbance area. | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | If the species if observed within the project site during the focused survey, CDFW shall be contacted and any construction activities within the disturbance area must be delayed until an appropriate course of action can be established and approved by CDFW.<br>B. Before any activities begin on the project, an approved biologist will conduct a worker's environmental awareness program (WEAP) for all construction personnel. At a minimum, the training will include a description of the red-bellied newt and its habitat, the specific measures that are being implemented to conserve the American badger for the current project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the WEAP, provided that a qualified person is on hand to answer any questions.<br>C. If an active badger den is identified during pre-construction surveys within or immediately adjacent to any impacted areas, a construction-free buffer of up to 300 ft. (or distance specified by the resource agencies, such as CDFW) will be established around the den. A qualified biological monitor should be present on the site during project development activities to ensure the buffer is adequate to avoid direct impact to individuals or den abandonment, and determine that young are of an independent age.<br>D. The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to implement the project. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction, and minimize the impact to American badger habitat; this goal includes locating access routes and construction areas outside of riparian areas to the maximum extent practicable.<br><br>**MM BIO-1e: Migratory and nesting birds and bats**<br>A. Implementation of the following avoidance and minimization measures would avoid or minimize potential effects to migratory birds and habitat in and adjacent to the project site. These measures shall be implemented for construction work during the nesting season (February 15 through August 31). | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | B. If construction or tree removal is proposed during the breeding/nesting season for migratory birds (typically February 15 through August 31), a qualified biologist shall conduct pre-construction surveys for northern harrier, grasshopper sparrow, pallid bat, Townsend's big-ear bat, and other migratory birds within the construction area, including a 300-foot survey buffer, no more than 3 days prior to the start of ground-disturbing activities in the construction area.<br>C. If an active nest is located during pre-construction surveys, USFWS and/or CDFW (as appropriate) shall be notified regarding the status of the nest. Furthermore, construction activities shall be restricted as necessary to avoid disturbance of the nest until it is abandoned or a qualified biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 300 feet around an active raptor nest and 50-foot radius around an active migratory bird nest) or alteration of the construction schedule.<br>D. A qualified biologist shall delineate the buffer using nest buffer signs, ESA fencing, pin flags, and or flagging tape. The buffer zone shall be maintained around the active nest site(s) until the young have fledged and are foraging independently. | |
| **Impact BIO-2:** The project may have adverse impacts on sensitive natural communities or riparian habitat. | No mitigation is necessary. | Less than significant impact. |
| **Impact BIO-3:** The proposed project may have a substantial adverse effect on wetlands or jurisdictional features. | **MM BIO-3: Impacts to wetlands**<br>• The Applicant shall obtain a Section 404 Clean Water Act (CWA) permit for impacts to waters of the United States. The Applicant shall also obtain a Section 401 permit from the Regional Water Quality Control Board (RWQCB). These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project.<br>• The Applicant shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • Compensatory mitigation may consist of (1) obtaining credits from a mitigation bank; (2) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities; and/or (3) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This final type of compensatory mitigation may be provided at or adjacent to the impact site (on-site mitigation) or at another location, usually within the same watershed as the permitted impact (off-site mitigation). The project/permit Applicant retains responsibility for the implementation and success of the mitigation project.<br>• Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project. | |
| **Impact BIO-4:** The project may have substantially adverse impacts on fish or wildlife movement. | Implement MMs BIO-1a to BIO-1e. | Less than significant impact. |
| **Impact BIO-5:** The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and it would not conflict with an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.4—Cultural Resources** | | |
| **Impact CUL-1:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources. | **MM CUL-1:** Because of the general proximity of known archaeological site CA-ALA-000024, an archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology should be present during the initial phase of ground disturbance in order to check for the inadvertent exposure of cultural materials. Once soils are made visible in areas of proposed ground disturbance, the archaeologist will assess the likelihood that they contain cultural resources and determine what additional monitoring, if any, will be required. In the event a potentially significant cultural resource is | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | encountered during subsurface earthwork activities, all construction activities within a 100-foot radius of the find shall cease and workers should avoid altering the materials until an archaeologist has evaluated the situation. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. Potentially significant cultural resources consist of but are not limited to stone, bone, glass, ceramics, fossils, wood, or shell artifacts, or features including hearths, structural remains, or historic dumpsites. The archaeologist shall make recommendations concerning appropriate measures that will be implemented to protect the resource, including but not limited to excavation and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Any previously undiscovered resources found during construction within the project site shall be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and will be submitted to the City of Pleasanton, the Northwest Information Center, and the State Historic Preservation Office (SHPO), as required. | |
| **Impact CUL-2:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources. | Implement MM CUL-1. | Less than significant impact. |
| **Impact CUL-3:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources. | **MM CUL-3:** A professional paleontologist shall be present during the initial phase of ground disturbance to check for the inadvertent exposure of fossils or other resources of paleontological value. This may be followed by regular periodic or "spot-check" paleontological monitoring during ground disturbance as needed, but full-time monitoring is not required at this time. In the event that fossils or fossil-bearing deposits are discovered during construction activities, excavations within a 100-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards and assess the significance of the find under the criteria set forth in | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If the Applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The plan shall be submitted to the City of Pleasanton for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan. | |
| **Impact CUL-4:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites. | **MM CUL-4:** In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code Sections 5097.94 and Section 5097.98 must be followed. If during the course of project development there is accidental discovery or recognition of any human remains, the following steps shall be taken:<br>1. There shall be no further excavation or disturbance within 100 feet of the remains until the County Coroner is contacted to determine if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and the NAHC shall identify the person or persons it believes to be the most likely descendant (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work within 48 hours, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.<br>2. Where the following conditions occur, the landowner or his or her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the project site in a location not subject to further subsurface disturbance:<br>• The NAHC is unable to identify a most likely descendent or the most | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | likely descendent failed to make a recommendation within 48 hours after being notified by the commission.<br>• The descendant identified fails to make a recommendation.<br>• The landowner or his authorized representative rejects the recommendation of the descendant, and mediation by the NAHC fails to provide measures acceptable to the landowner.<br><br>Additionally, California Public Resources Code Section 15064.5 requires the following relative to Native American Remains:<br>• When an initial study identifies the existence of, or the probable likelihood of, Native American Remains within a project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop a plan for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American Burials with the appropriate Native Americans as identified by the Native American Heritage Commission. | |
| **Section 3.5—Geology, Soils, and Seismicity** | | |
| **Impact GEO-1:** The project would potentially expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:<br>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.<br>ii) Strong seismic ground shaking.<br>iii) Seismic-related ground failure, including liquefaction.<br>iv) Landslides. | **MM GEO-1a:** The project applicant shall adhere to the recommendations set forth in the 2015 ENGEO Geotechnical Feasibility Report for building foundation design. Structures shall be supported on structural mat foundations, with a minimum matt thickness of 10-12 inches. Maximum allowable bearing loads may also be increased by one-third when considering total loads from wind and seismic activities. Building design shall also include up to 1 inch of differential settlement, over a distance of 50 feet.<br><br>**MM GEO-1b:** The applicant shall remove all existing colluvium and landslide debris within the residential development limit within the west-facing slope located near the 25-percent slope limit. On-site soil and rock material shall be processed to remove concentrations of organic material and particles greater than 8 inches if it is to be used as fill material. Building pads shall also be reconstructed to create uniform subgrade conditions by sub excavating the soil on building pads to a minimum depth of 2 feet below | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | finished pad grade on cut lots or lots constructed over cut-and-fill transitions and replacing the sub excavated material with uniformly mixed compacted fill. Sub excavations shall be performed over the entire flat pad area. Different fill thickness across any lot shall be no greater than 10 feet. Slope gradients shall not be steeper than 3:1. Slopes inclined steeper than 3:1 will require evaluation and geogrid reinforcement. Further details regarding soil engineering and building design can be found under "Preliminary Site Recommendations" of the ENGEO report. | |
| **Impact GEO-2:** The project would potentially result in substantial soil erosion or the loss of topsoil. | Implement MMs GEO-1a and GEO-1b. | Less than significant impact. |
| **Impact GEO-3:** The project would 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. | Implement MM GEO-1b and the following:<br>**MM GEO-3:** The contractor shall key and bench where fill is placed on original grade with a gradient of 6:1 or steeper. A minimum 24-foot-wide keyway inward from the toe of the new fill slope shall be constructed as shown on Figure 10 of the Geotechnical Feasibility Report in Appendix E. Extension of the keyway at least 3 feet below original grade into firm competent soil/rock shall be approved by a Geotechnical Engineer. Benches shall be cut into original grade after the keyway has been nearly filled with compacted engineered fill. Benches shall be constructed into original slope grade as filling proceeds every 2 feet vertically, to remove loose soil/rock. Deeper bench depths may be required depending on actual conditions observed during construction. Bench widths will vary depending on the original slope grade and actual bench depth. Buildings shall be set back from the top of slope in accordance with CBC requirements. Alternatively, deep foundations such as pier-and-grade-beam foundations should be anticipated for buildings close to the top of slopes. | Less than significant impact. |
| **Impact GEO-4:** The project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), potentially creating substantial risks to life or property. | Implement MMs GEO-1a and MM GEO-1b. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact GEO-5:** The project would not use septic tanks or alternative wastewater disposal systems. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.6—Greenhouse Gas Emissions** | | |
| **Impact GHG-1:** Implementation of the project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment. | No mitigation is necessary. | *Short-term and long-term impacts* Less than significant impact. |
| **Impact GHG-2:** Implementation of the project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.7—Hazards and Hazardous Materials** | | |
| **Impact HAZ-1:** The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-2:** The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-3:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-4:** The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact HAZ-5:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.8—Hydrology and Water Quality** | | |
| **Impact HYD-1:** The project may have the potential to violate any water quality standards or waste discharge requirements. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-2:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-3:** The project would not substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial surface runoff, flooding on- or off-site, erosion or siltation on- or off-site. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-4:** The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-5:** The project would not otherwise substantially degrade water quality. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-6:** Development and land use activities contemplated by the proposed project would not place housing or other land uses within a 100-year flood hazard area as mapped on a federal Flood Insurance Rate Map nor place structures within a 100-year flood zone which would impede or redirect flood flows. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact HYD-7:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-8:** The project would not be inundation by seiche, tsunami, or mudflow. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.9—Land Use and Planning** | | |
| **Impact LUP-1:** The project would not physically divide an established community. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-2:** The project would not conflict with any applicable provisions of the Pleasanton General Plan, the Urban Growth Boundary, or the Happy Valley Specific Plan, adopted for the purpose of avoiding or mitigating an environmental effect. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-3:** The project would not conflict with any applicable provisions of the Pleasanton Municipal Code, or Measures PP and QQ, adopted for the purpose of avoiding or mitigating an environmental effect. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-4:** The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.10—Noise** | | |
| **Impact NOI-1:** The project would not generate or expose persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. | *Short-term impacts*<br>**MM NOI-1:** In addition to requiring that all project developers comply with the applicable construction noise exposure criteria established within the City's Municipal Code 9.04.100, the City shall require developers on the potential sites for rezoning to implement construction best management practices to reduce construction noise, including:<br>• The construction contractor shall ensure that all equipment driven by | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.<br>• The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.<br>• The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.<br>• At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.<br>• The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.<br>• The construction contractor shall ensure that all on-site construction activities, including deliveries and engine warm-up, shall be restricted to the hours of 8:00 a.m. to 8:00 p.m. daily, except Sunday and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration or repair activities.<br><br>*Long-term impacts*<br>No mitigation is necessary. | |
| **Impact NOI-2:** The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Impact NOI-3:** The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact NOI-4:** The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Impact NOI-5:** The project would not be 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. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>No impact. |
| **Impact NOI-6:** The project would not be located within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>No impact. |
| **Section 3.11—Public Services** | | |
| **Impact PS-1:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-2:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact PS-3:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-4:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-5:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.12—Transportation and Traffic** | | |
| **Impact TRANS-1:** The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing With Project Conditions. | **MM TRANS-1:** Prior to the commencement of construction, the project applicant shall retain a qualified transportation consultant to prepare and submit a construction traffic management plan to the City of Pleasanton for review and approval. The plan shall include the following elements:<br>• Project staging plan to maximize on-site storage of materials and equipment | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes<br>• Permitted construction hours<br>• Location of construction staging<br>• Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations<br>• Provisions for street sweeping to remove construction related debris on public streets | |
| **Impact TRANS-2:** The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Near-Term With Project Conditions. | No mitigation is necessary. | Less than significant impact. |
| **Impact TRANS-3:** The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Cumulative With Project Conditions. | **MM TRANS-3:** Prior to issuance of building permits, the applicant shall pay all adopted local and regional transportation impact fees in accordance with the City's Development Impact Fee Program. | Less than significant impact. |
| **Impact TRANS-4:** The project may 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. | Implement Mitigation Measure TRANS-3. | Less than significant impact. |
| **Impact TRANS-5:** The project may substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). | **MM TRANS-5a:** Prior to issuance of building permits, the project applicant shall:<br>• Install traffic calming measures along Alisal Street at Sycamore Road and at Alisal Court that are consistent with the rural nature of the roadway, subject to the review and approval of the Director of Community Development. Measures that could be considered include roundabouts, traffic circles, additional pavement markings, speed lumps and radar speed signs. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | **MM TRANS-5b:** Prior to issuance of building permits, the project applicant shall submit site plans that show:<br>• Either revise the project plans to reduce the number of direct private driveway connections to Clubhouse Drive through the project site, or provide other measures acceptable to City of Pleasanton Traffic Engineering that would reduce potential conflicts between vehicles exiting driveways and traffic on Clubhouse Drive ; and<br>• Provide sidewalks with a landscape buffer on both sides of the street | |
| **Impact TRANS-6:** The project would not result in inadequate emergency access. | No mitigation is necessary. | Less than significant impact. |
| **Impact TRANS-7:** The project may conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. | **MM TRANS-7:** Prior to issuance of building permits, the project applicant shall submit site plans that would be consistent with the intent of the planned network shown in the Draft Trails Master Plan and Happy Valley Specific Plan, including one or more north-south connections through the project, or an alternative trail connection determined by the City to be equivalent, to that connection. All trails shall be designed as required for the applicable facility type in the Draft Trails Master Plan. Show all proposed trail designs are consistent with the Trails Master Plan. The site plans shall show that pedestrian and bicycle connections are provided from cul-de-sacs to adjacent streets where applicable, such as at the new Westbridge Lane cul-de-sac, and there are no conflicts with General Plan Policy 7, Program 7.3. In addition, trail construction shall be completed prior to issuance of occupancy permits. | Less than significant impact. |
| **Section 3.13—Tribal Cultural Resources** | | |
| **Impact TCR-1:** The project would not cause a substantial adverse change in the significance of a tribal cultural resource 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), | No mitigation is necessary. | No impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact TCR-2:** The project would not cause a substantial adverse change in the significance of a tribal cultural 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 Resources Code Section 5024.1. | No mitigation is necessary. | No impact. |
| **Section 3.14—Utilities and Service Systems** | | |
| **Impact USS-1:** The proposed project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-2:** The proposed project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-3:** The proposed project would not create a need for new or expanded downstream storm drainage facilities. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-4:** The proposed project would be served with adequate water supplies and would not require additional entitlements or the construction or expansion of water facilities. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-5:** The project would result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-6:** The project would be served with adequate landfill capacity. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact USS-7:** The project would comply with federal, state, and local statutes and regulations related to solid waste. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-8:** The project would not result in the inefficient, unnecessary, or wasteful use of energy. | No mitigation is necessary. | Less than significant impact. |

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FIRSTCARBONSOLUTIONS™

# DRAFT
# Subsequent Environmental Impact Report
# Spotorno Ranch Project
# City of Pleasanton, Alameda County, California

## State Clearinghouse Number 2017042032


Prepared for:
**City of Pleasanton**
Community Development Department
200 Old Bernal Avenue
PO Box 520
Pleasanton, CA 94566
925.931.5615

Contact: Jenny Soo, Associate Planner

Prepared by:
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
925.357.2562

Contact: Mary Bean, Project Director
Elizabeth Johnson, Project Manager


Date: July 16, 2018

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| $\mu g/m^3$ | micrograms per cubic meter |
| AAQS | Ambient Air Quality Standards |
| AB | Assembly Bill |
| ACHP | Advisory Council on Historic Preservation |
| ACM | asbestos-containing material |
| ACP | Alternative Compliance Plan |
| ADA | Americans with Disabilities Act |
| ADT | average daily traffic |
| af | acre-foot |
| afy | acre-feet per year |
| AIA | Airport Influence Area |
| AIC | Archaeological Information Center |
| AICUZ | Air Installation Compatibility Use Zone |
| ALUC | Airport Land Use Commission |
| APCD | Air Pollution Control District |
| APE | Area of Potential Effect |
| APN | Assessor's Parcel Number |
| AQMD | Air Quality Management |
| ARB | California Air Resources Board |
| AST | aboveground storage tank |
| ATCM | Airborne Toxic Control Measures |
| BMP | Best Management Practices |
| BVOC | biogenic volatile organic compound |
| C | Celsius |
| CAAQS | California Ambient Air Quality Standards |
| CAL FIRE | California Department of Forestry and Fire Protection |
| Cal OSHA | California Occupational Health and Safety Administration |
| Cal/EPA | California Environmental Protection Agency |
| Caltrans | California Department of Transportation |
| CAP | Clean Air Plan |
| CCR | California Code of Regulations |
| CDFW | California Department of Fish and Wildlife |
| CEQA | California Environmental Quality Act |
| CESA | California Endangered Species Act |
| CFC | chlorofluorocarbon |

| | |
|---|---|
| CFR | Code of Federal Regulations |
| $CH_4$ | methane |
| CHL | California Historical Landmarks |
| CMP | Congestion Management Plan |
| CNDDB | California Natural Diversity Database |
| CNEL | Community Noise Equivalent Level |
| CNPS | California Native Plant Society |
| CO | carbon monoxide |
| $CO_2e$ | carbon dioxide equivalent |
| CPHI | California Points of Historical Interest |
| CPUC | California Public Utilities Code |
| CUPA | Certified Unified Program Agency |
| dB | decibel |
| DOT | United States Department of Transportation |
| DPM | diesel particulate matter |
| DTSC | California Department of Toxic Substances Control |
| EIR | Environmental Impact Report |
| EPA | United States Environmental Protection Agency |
| ESA | Endangered Species Act |
| F | Fahrenheit |
| FAR | floor area ratio |
| FCS | FirstCarbon Solutions |
| FEMA | Federal Emergency Management Agency |
| FHWA | Federal Highway Administration |
| FIRM | Flood Insurance Rate Map |
| GWh/y | gigawatt-hours per year |
| GWP | global warming potential |
| HCM | Highway Capacity Manual |
| HFC | hydrofluorocarbon |
| HOV/HOT | High Occupancy Vehicle/High Occupancy Toll |
| HRA | Health Risk Assessment |
| HRI | California Historic Resources Inventory |
| HVAC | heating, ventilation, and air conditioning |
| HVSP | Happy Valley Specific Plan |
| I | Interstate |
| $L_{dn}$ | day/night average sound level |
| LED | light emitting diode |
| $L_{eq}$ | equivalent sound level |

| | |
|---|---|
| LOS | Level of Service |
| MBTA | Migratory Bird Treaty Act |
| mgd | million gallons per day |
| MMI | Modified Mercalli Intensity |
| mph | miles per hour |
| MTS | Metropolitan Transportation System |
| MXD | mixed-use development |
| $N_2O$ | nitrous oxide |
| NAAQS | National Ambient Air Quality Standards |
| NESHAP | National Emissions Standards for Hazardous Air Pollutants |
| NHPA | National Historic Preservation Act |
| $NO_2$ | nitrogen dioxide |
| NOC | Notice of Completion |
| NOP | Notice of Preparation |
| $NO_X$ | nitrogen oxides |
| NPDES | National Pollutant Discharge Elimination System |
| NRCS | Natural Resources Conservation Service |
| NRHP | National Register of Historic Places |
| $O_3$ | ozone |
| OEHHA | California Office of Environmental Health Hazard Assessment |
| PCB | polychlorinated biphenyl |
| pCi/L | picocuries per liter |
| PFC | perfluorocarbon |
| Phase I ESA | Phase I Environmental Site Assessment |
| $PM_x$ | particulate matter |
| ppb | parts per billion |
| ppm | parts per million |
| PPV | peak particle velocity |
| PVC | polyvinyl chloride |
| RMP | Risk Management Plan |
| ROG | reactive organic gases |
| RWQCB | Regional Water Quality Control Board |
| $SF_6$ | sulfur hexafluoride |
| $SO_2$ | sulfur dioxide |
| SR | State Route |
| SWPPP | Stormwater Pollution Prevention Plan |
| SWRCB | State Water Resources Control Board |
| TAC | toxic air contaminants |

| | |
|---|---|
| TCM | transportation control measures |
| TDM | Transportation Demand Management |
| TDS | total dissolved solids |
| Tg | teragram |
| therms/y | therms per year |
| TMA | Transportation Management Association |
| TMDL | Total Maximum Daily Load |
| TOD | Transit Oriented Development |
| USACE | United States Army Corps of Engineers |
| USFWS | United States Fish and Wildlife Service |
| UST | underground storage tank |
| UWMP | Urban Water Management Plan |
| V/C | volume to capacity ratio |
| WDR | Waste Discharge Requirements |

# EXECUTIVE SUMMARY

## Purpose

This Draft Subsequent Environmental Impact Report (Draft SEIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Spotorno Ranch Project (State Clearinghouse No. 2017042032). This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.).

The purpose of this Draft SEIR is to inform decision-makers, representatives of affected and responsible agencies, the public, and other interested parties of the potential environmental effects that may result from implementation of the proposed project. This Draft SEIR describes potential impacts relating to a wide variety of environmental issues and methods by which these impacts can be mitigated or avoided.

## Project Summary

### Project Location

The project is located in the southern portion of the City of Pleasanton. The approximately 154.7-acre site is bounded by Alisal Street to the west, Westbridge Lane to the south, residential homes to the north, and open space to the east.

### Project Description

The proposed Spotorno Ranch project (project) consists of development of 39 single-family residences on an approximately 154-acre site in the southern portion of the City of Pleasanton.

The project site is made up of Lot 97 (43 acres) and Lot 98 (111 acres) of the HVSP (see Exhibit 2-14 in Section 2, Project Description). The proposed residences would be constructed on an approximately 31-acre portion of Lot 98; the remaining 80 acres would be zoned Planned Unit Development-Agriculture-Open Space (PUD-A/OS) and the applicant proposes to record a conservation easement over this acreage. In addition, the project includes an amendment to the HVSP to change the residential density of the development site from Planned Unit Development-Semi-Rural Residential (PUD-SRDR) to Planned Unit Development-Low Density Residential (PUD-LDR). An amendment to the HVSP to eliminate the proposed Bypass Road included as part of the HVSP circulation plan, is also proposed.

On Lot 97, the approximately 15 acres designated by the HVSP for Planned Unit Development—Medium Density Residential (PUD-MDR) would be changed to Planned Unit Development-Agriculture/Open Space (PUD-A/OS) (see Exhibits 2-14 and 2-15 in Section 2.0, Project Description). The remaining acreage in Lot 97 would maintain its PUD-A/OS zoning. The Spotorno Family would retain the entirety of Lot 97.

All homes would be developed to the standards established in the HVSP. Full project buildout would result in the development of roadway improvements, trails, landscaping, and bio retention facilities.

### Project Objectives

The objectives of the proposed project are to:

- Create a high-quality, single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped open space with adequate publicly accessible connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent Measures PP and QQ.[1]

## Significant Unavoidable Adverse Impacts

The proposed project would not result in significant unavoidable impacts.

## Summary of Project Alternatives

Below is a summary of the alternatives to the proposed project considered in Section 5, Alternatives to the proposed project.

### No Project/No Build Alternative

Under the No Project/No Build Alternative the proposed project would not be constructed and the project site would remain vacant. No new housing, roads, or trails would be developed on the approximately 154-acre site.

### 22 Lot Development on Spotorno Flat Area Alternative

Under this alternative, the project would develop 22 residential units, instead of 39, on the Spotorno Flat Area portion of the project site. The bypass road would not be constructed. Other aspects of this alternative are described in more detail in Section 5, Alternatives.

### 39 Units With Construction of the Bypass Road Alternative

Under this alternative, the project would develop 39 residential units on the Spotorno Flat Area portion of the site and construct a bypass road using the alignment approved by the City in 2007. The bypass road would be constructed to link Westbridge Lane and Sycamore Creek Lane. Other aspects of this alternative are described in more detail in Section 5, Alternatives.

[1] As stated above, the project would include both a General Plan Amendment and amendment to the HVSP. The transportation improvements and residential developments would conform with the HVSP and subsequent Measures PP and QQ, assuming approval of these amendments.

## Areas of Controversy

Pursuant to CEQA Guidelines Section 15123(b), a summary section must address areas of controversy known to the lead agency, including issues raised by agencies and the public, and it must also address issues to be resolved, including the choice among alternatives and whether or how to mitigate the significant effects.

A Notice of Preparation (NOP) for the proposed project was issued on Friday, April 7, 2017. The NOP describing the original concept for the project and issues to be addressed in the SEIR was distributed to the State Clearinghouse, responsible agencies, and other interested parties for a 30-day public review period extending from April 7, 2017 through May 8, 2017. The NOP identified the potential for significant impacts on the environment related to the following topical areas:

- Aesthetics, Light, and Glare
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Public Services and Recreation
- Transportation
- Utilities and Service Systems
- Mandatory Findings of Significance

### Disagreement Among Experts

This Draft SEIR contains substantial evidence to support all the conclusions presented herein. It is possible that there will be disagreement among various parties regarding these conclusions, although the City of Pleasanton is not aware of any disputed conclusions at the time of this writing. Both the CEQA Guidelines and case law clearly provide the standards for treating disagreement among experts. Where evidence and opinions conflict on an issue concerning the environment, and the lead agency knows of these controversies in advance, the SEIR must acknowledge the controversies, summarize the conflicting opinions of the experts, and include sufficient information to allow the public and decision makers to make an informed judgment about the environmental consequences of the proposed project.

### Potentially Controversial Issues

Below is a list of potentially controversial issues that may be raised during the public review and hearing process of this Draft SEIR:

- Transportation and Traffic
- Land Use
- Aesthetics and Visual Resources
- Cumulative Effects

It is also possible that evidence will be presented during the 45-day, statutory Draft SEIR public review period that may create disagreement. Decision-makers would consider this evidence during the public hearing process.

In rendering a decision on a project where there is disagreement among experts, the decision-makers are not obligated to select the most environmentally preferable viewpoint. Decision-makers are vested with the ability to choose whatever viewpoint is preferable and need not resolve a dispute among experts. In their proceedings, decision-makers must consider comments received concerning the adequacy of the Draft SEIR and address any objections raised in these comments. However, decision-makers are not obligated to follow any directives, recommendations, or suggestions presented in comments on the Draft SEIR, and can certify the Final SEIR without needing to resolve disagreements among experts.

## Public Review of the Draft SEIR

Upon completion of the Draft SEIR, the City of Pleasanton filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft SEIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the Draft SEIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft SEIR, including the technical appendices, is available for review at the City of Pleasanton offices and the City of Pleasanton Library. The address for each location is provided below.

City of Pleasanton—Planning Division
Monday through Friday, 8 a.m.–5 p.m.
City of Pleasanton
200 Old Bernal Avenue
Pleasanton, CA 94566

City of Pleasanton, Library
400 Old Bernal Avenue
Pleasanton, CA 94566
Hours: Monday–Thursday, 10:00 a.m.-9:00 p.m.
Friday–Saturday, 10:00 a.m.-5:00 p.m.
Sunday, 1:00 p.m.-5:00 p.m.

Agencies, organizations, and interested parties have the opportunity to comment on the Draft SEIR during the 45-day public review period. Written comments on this Draft SEIR should be addressed to:

Jenny Soo, Associate Planner
City of Pleasanton
Community Development Department
200 Old Bernal Avenue
PO Box 520
Pleasanton, CA 94566
Email: jsoo@cityofpleasantonca.gov

Submittal of electronic comments in Microsoft Word or Adobe PDF format is encouraged. Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review by the commenting agencies at least 10 days prior to the public hearing before the City of Pleasanton on the project, at which the certification of the Final SEIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by decision makers for the project.

## Executive Summary Matrix

Table ES-1 summarizes the impacts, mitigation measures, and resulting level of significance after mitigation for the relevant environmental issue areas evaluated for the proposed project. The table is intended to provide an overview; narrative discussions for the issue areas are included in the corresponding section of this SEIR. Table ES-1 is included in the SEIR as required by CEQA Guidelines Section 15123(b)(1).

Applicable Mitigation Measures from the Happy Valley Specific Plan FEIR are listed in Appendix J.

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## Table ES-1: Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Section 3.1—Aesthetics, Light, and Glare** | | |
| **Impact AES-1:** The project would not have a substantial adverse effect on a scenic vista. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-2:** The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-3:** The project would not substantially degrade the existing visual character or quality of the site and its surroundings. | No mitigation is necessary. | Less than significant impact. |
| **Impact AES-4:** The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.2—Air Quality** | | |
| **Impact AIR-1:** The project would not conflict with or obstruct implementation of the applicable air quality plan. | Implement MM AIR-2 and MM AIR-4. | Less than significant impact. |
| **Impact AIR-2:** The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. | *Short-term Impacts*<br>**MM AIR-2:** During construction, the following air pollution control measures shall be implemented:<br>• Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or more as needed.<br>• All haul trucks transporting soil, sand, or other loose material off-site shall be covered<br>• All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.<br>• All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour.<br>• All roadways, driveways, and sidewalks shall be paved as soon as possible. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.<br>• All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.<br>• A publicly visible sign shall be posted with the telephone number and person to contact both at the City of Pleasanton and at the office of the General Contractor regarding dust complaints. This person shall respond and take corrective action within 2 business days of a complaint or issue notification. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.<br><br>*Long-term impacts*<br>No mitigation is necessary. | |
| **Impact AIR-3:** The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors). | *Short-term impacts*<br>Implement MM AIR-2.<br><br>*Long-term impacts*<br>No mitigation is necessary. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |
| **Impact AIR-4:** The project would not expose sensitive receptors to substantial pollutant concentrations. | *Short-term impacts*<br>Implement MM AIR-2 and the following:<br>**MM AIR-4:** The developer or project applicant shall ensure all off-road construction equipment in excess of 50 horsepower used on-site by the developer or contractors is equipped with engines meeting the EPA Tier III off-road engine emission standards. The construction contractor shall maintain a log of equipment use at the construction site with make, model, serial number, and certification level of each piece of construction equipment that will be available for review by the City's building inspection staff. | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | *Long-term impacts*<br>No mitigation is necessary. | |
| **Impact AIR-5:** The project would not create objectionable odors affecting a substantial number of people. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Section 3.3—Biological Resources** | | |
| **Impact BIO-1:** The proposed project may have a substantial adverse impact on special-status plant and wildlife species. | **MM BIO-1a: Focused surveys for Congdon's tar plant and big tarplant**<br>A. LOA shall conduct focused surveys for the abovementioned species during the summer of 2018. If the focused surveys confirm that these species are absent from the impacted areas of the site, then mitigation would not be required. If the focused surveys confirm that these species are present in the impacted areas of the site, then the following measures shall be implemented to ensure that impacts are reduced to a less than significant level:<br>B. In consultation with a qualified botanist or plant ecologist, and to the maximum extent feasible, the project will be designed to avoid substantial direct and indirect impacts to these species. If the project cannot be designed to avoid significant impacts to these plant species, then the following compensatory measures will be implemented:<br>C. On-site preservation—The on-site proposed open space area should be surveyed during the appropriate blooming season to determine whether populations of the species being significantly impacted by the project are also present within areas that will be preserved. If populations of the species are present on the preservation area, it should be determined by a qualified botanist or plant ecologist whether these populations to be preserved would adequately compensate, or partially compensate, for lost populations on the project site. If it is determined that preserved populations would completely compensate for impacted populations, then no further compensation would be required. However, if it is determined that populations of the impacted species are absent from the site, or that they are present but their preservation would only partially mitigate for lost populations, then additional mitigation measures described below will be implemented. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | D. Off-site mitigation—Mitigation for impacted plant species could be accommodated through restoration or preservation at an off-site location. The mitigation site must be confirmed to support populations of the impacted species and must be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar preservation mechanism. A qualified botanist or plant ecologist should prepare a Preservation Plan for the site containing at a minimum the following elements:<br>• A monitoring plan and performance criteria for the preserved plant population<br>• A description of remedial measures to be performed in the event that performance criteria are not met<br>• A description of maintenance activities to be conducted on the site, including weed control, trash removal, irrigation, and control of herbivory by livestock and wildlife<br>E. The project applicant will be responsible for funding the development and implementation of any on-site or off-site preservation plan<br><br>**MM BIO-1b: California tiger salamander (CTS)**<br>As stated in section 3.3.2, CTS have been formerly documented breeding in ponds within 1.5 miles of the project site. Because of the prior presence of CTS within 1.5 miles of the project site, the following mitigation measures are recommended.<br>A. A qualified biologist will conduct preconstruction surveys prior to ground breaking activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site by a qualified biologist.<br>B. Prior to the start of construction, a qualified biologist will train all construction personnel regarding habitat sensitivity, identification of special status species potentially occurring on the site, and required practices. A representative shall be appointed by the applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a CTS or who finds a dead, injured or entrapped individual. The representative shall be identified during the | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | tailgate/training session. The representative's name and telephone number shall be provided to the Service prior to the initiation of ground disturbance activities.<br>C. A Service-approved biologist should be present for ground disturbing activities. The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CTS from moving into these areas. Construction activities should be limited to the period from May 1 through October 31.<br>D. Because dusk and dawn are often the times when CTS are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Construction personnel will inspect open trenches in the morning and evening for trapped amphibians. No canine or feline pets or firearms (except for federal, state, or local law enforcement officers and security personnel) shall be permitted at the project site to avoid harassment, killing, or injuring of CTS.<br>E. To minimize harm or mortality to individual CTS during migration movements, a maximum speed limit of 10 mph for vehicle traffic on the project site during both construction and operation phases will be enforced.<br><br>**MM BIO-1c: Burrowing owl**<br>A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified biologist to conduct a preconstruction survey on the project site. The survey shall establish the presence or absence of western burrowing owl and/or habitat features, and evaluate use by owls in accordance with CDFW survey guidelines.<br>B. On the parcel where the activity is proposed, the biologist shall survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership need not be surveyed. The survey shall take place near the sunrise or sunset in accordance with CDFW guidelines. All burrows or burrowing owls shall be identified and mapped. During the breeding season (February 1–August 31), | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | surveys shall document whether burrowing owls are nesting on or directly adjacent to disturbance areas. During the non-breeding season (September 1–January 31), surveys shall document whether burrowing owls are using habitat on or directly adjacent to any disturbance area. Survey results will be valid only for the season during which the survey is conducted.<br>C. If burrowing owls are not discovered, further mitigation is not required. If burrowing owls are observed during the pre-construction surveys, the applicant shall perform the following measures to limit the impact on the burrowing owls:<br>1. Avoidance shall include establishment of a 160-foot non-disturbance buffer zone. Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation, or that the juveniles from the occupied burrows have fledged. During the non-breeding season (September 1–January 31), the project proponent shall avoid the owls and the burrows they are using, if possible. Avoidance shall include the establishment of a 160-foot non-disturbance buffer zone.<br>2. If it is not possible to avoid occupied burrows, passive relocation shall be implemented. Owls shall be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors shall be in place for 48 hours prior to excavation. The project area shall be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent re-occupation. Plastic tubing or a similar structure shall be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.<br>**MM BIO-1d: American badger**<br>A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified wildlife biologist to conduct a focused survey for the American badger to determine presence or absence of this species within a 300-foot radius of the disturbance area. | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | If the species if observed within the project site during the focused survey, CDFW shall be contacted and any construction activities within the disturbance area must be delayed until an appropriate course of action can be established and approved by CDFW.<br>B. Before any activities begin on the project, an approved biologist will conduct a worker's environmental awareness program (WEAP) for all construction personnel. At a minimum, the training will include a description of the red-bellied newt and its habitat, the specific measures that are being implemented to conserve the American badger for the current project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the WEAP, provided that a qualified person is on hand to answer any questions.<br>C. If an active badger den is identified during pre-construction surveys within or immediately adjacent to any impacted areas, a construction-free buffer of up to 300 ft. (or distance specified by the resource agencies, such as CDFW) will be established around the den. A qualified biological monitor should be present on the site during project development activities to ensure the buffer is adequate to avoid direct impact to individuals or den abandonment, and determine that young are of an independent age.<br>D. The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to implement the project. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction, and minimize the impact to American badger habitat; this goal includes locating access routes and construction areas outside of riparian areas to the maximum extent practicable.<br><br>**MM BIO-1e: Migratory and nesting birds and bats**<br>A. Implementation of the following avoidance and minimization measures would avoid or minimize potential effects to migratory birds and habitat in and adjacent to the project site. These measures shall be implemented for construction work during the nesting season (February 15 through August 31). | |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | B. If construction or tree removal is proposed during the breeding/nesting season for migratory birds (typically February 15 through August 31), a qualified biologist shall conduct pre-construction surveys for northern harrier, grasshopper sparrow, pallid bat, Townsend's big-ear bat, and other migratory birds within the construction area, including a 300-foot survey buffer, no more than 3 days prior to the start of ground-disturbing activities in the construction area.<br>C. If an active nest is located during pre-construction surveys, USFWS and/or CDFW (as appropriate) shall be notified regarding the status of the nest. Furthermore, construction activities shall be restricted as necessary to avoid disturbance of the nest until it is abandoned or a qualified biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 300 feet around an active raptor nest and 50-foot radius around an active migratory bird nest) or alteration of the construction schedule.<br>D. A qualified biologist shall delineate the buffer using nest buffer signs, ESA fencing, pin flags, and or flagging tape. The buffer zone shall be maintained around the active nest site(s) until the young have fledged and are foraging independently. | |
| **Impact BIO-2:** The project may have adverse impacts on sensitive natural communities or riparian habitat. | No mitigation is necessary. | Less than significant impact. |
| **Impact BIO-3:** The proposed project may have a substantial adverse effect on wetlands or jurisdictional features. | **MM BIO-3: Impacts to wetlands**<br>• The Applicant shall obtain a Section 404 Clean Water Act (CWA) permit for impacts to waters of the United States. The Applicant shall also obtain a Section 401 permit from the Regional Water Quality Control Board (RWQCB). These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project.<br>• The Applicant shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • Compensatory mitigation may consist of (1) obtaining credits from a mitigation bank; (2) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities; and/or (3) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This final type of compensatory mitigation may be provided at or adjacent to the impact site (on-site mitigation) or at another location, usually within the same watershed as the permitted impact (off-site mitigation). The project/permit Applicant retains responsibility for the implementation and success of the mitigation project.<br>• Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project. | |
| **Impact BIO-4:** The project may have substantially adverse impacts on fish or wildlife movement. | Implement MMs BIO-1a to BIO-1e. | Less than significant impact. |
| **Impact BIO-5:** The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and it would not conflict with an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.4—Cultural Resources** | | |
| **Impact CUL-1:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources. | **MM CUL-1:** Because of the general proximity of known archaeological site CA-ALA-000024, an archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology should be present during the initial phase of ground disturbance in order to check for the inadvertent exposure of cultural materials. Once soils are made visible in areas of proposed ground disturbance, the archaeologist will assess the likelihood that they contain cultural resources and determine what additional monitoring, if any, will be required. In the event a potentially significant cultural resource is | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | encountered during subsurface earthwork activities, all construction activities within a 100-foot radius of the find shall cease and workers should avoid altering the materials until an archaeologist has evaluated the situation. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. Potentially significant cultural resources consist of but are not limited to stone, bone, glass, ceramics, fossils, wood, or shell artifacts, or features including hearths, structural remains, or historic dumpsites. The archaeologist shall make recommendations concerning appropriate measures that will be implemented to protect the resource, including but not limited to excavation and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Any previously undiscovered resources found during construction within the project site shall be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and will be submitted to the City of Pleasanton, the Northwest Information Center, and the State Historic Preservation Office (SHPO), as required. | |
| **Impact CUL-2:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources. | Implement MM CUL-1. | Less than significant impact. |
| **Impact CUL-3:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources. | **MM CUL-3:** A professional paleontologist shall be present during the initial phase of ground disturbance to check for the inadvertent exposure of fossils or other resources of paleontological value. This may be followed by regular periodic or "spot-check" paleontological monitoring during ground disturbance as needed, but full-time monitoring is not required at this time. In the event that fossils or fossil-bearing deposits are discovered during construction activities, excavations within a 100-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards and assess the significance of the find under the criteria set forth in | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to resume at the location of the find. If the Applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The plan shall be submitted to the City of Pleasanton for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan. | |
| **Impact CUL-4:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites. | **MM CUL-4:** In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code Sections 5097.94 and Section 5097.98 must be followed. If during the course of project development there is accidental discovery or recognition of any human remains, the following steps shall be taken:<br>1. There shall be no further excavation or disturbance within 100 feet of the remains until the County Coroner is contacted to determine if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and the NAHC shall identify the person or persons it believes to be the most likely descendant (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work within 48 hours, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.<br>2. Where the following conditions occur, the landowner or his or her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the project site in a location not subject to further subsurface disturbance:<br>• The NAHC is unable to identify a most likely descendent or the most | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | likely descendent failed to make a recommendation within 48 hours after being notified by the commission.<br>• The descendant identified fails to make a recommendation.<br>• The landowner or his authorized representative rejects the recommendation of the descendant, and mediation by the NAHC fails to provide measures acceptable to the landowner.<br><br>Additionally, California Public Resources Code Section 15064.5 requires the following relative to Native American Remains:<br>• When an initial study identifies the existence of, or the probable likelihood of, Native American Remains within a project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop a plan for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American Burials with the appropriate Native Americans as identified by the Native American Heritage Commission. | |
| **Section 3.5—Geology, Soils, and Seismicity** | | |
| **Impact GEO-1:** The project would potentially expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:<br>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.<br>ii) Strong seismic ground shaking.<br>iii) Seismic-related ground failure, including liquefaction.<br>iv) Landslides. | **MM GEO-1a:** The project applicant shall adhere to the recommendations set forth in the 2015 ENGEO Geotechnical Feasibility Report for building foundation design. Structures shall be supported on structural mat foundations, with a minimum matt thickness of 10-12 inches. Maximum allowable bearing loads may also be increased by one-third when considering total loads from wind and seismic activities. Building design shall also include up to 1 inch of differential settlement, over a distance of 50 feet.<br><br>**MM GEO-1b:** The applicant shall remove all existing colluvium and landslide debris within the residential development limit within the west-facing slope located near the 25-percent slope limit. On-site soil and rock material shall be processed to remove concentrations of organic material and particles greater than 8 inches if it is to be used as fill material. Building pads shall also be reconstructed to create uniform subgrade conditions by sub excavating the soil on building pads to a minimum depth of 2 feet below | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | finished pad grade on cut lots or lots constructed over cut-and-fill transitions and replacing the sub excavated material with uniformly mixed compacted fill. Sub excavations shall be performed over the entire flat pad area. Different fill thickness across any lot shall be no greater than 10 feet. Slope gradients shall not be steeper than 3:1. Slopes inclined steeper than 3:1 will require evaluation and geogrid reinforcement. Further details regarding soil engineering and building design can be found under "Preliminary Site Recommendations" of the ENGEO report. | |
| **Impact GEO-2:** The project would potentially result in substantial soil erosion or the loss of topsoil. | Implement MMs GEO-1a and GEO-1b. | Less than significant impact. |
| **Impact GEO-3:** The project would 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. | Implement MM GEO-1b and the following:<br>**MM GEO-3:** The contractor shall key and bench where fill is placed on original grade with a gradient of 6:1 or steeper. A minimum 24-foot-wide keyway inward from the toe of the new fill slope shall be constructed as shown on Figure 10 of the Geotechnical Feasibility Report in Appendix E. Extension of the keyway at least 3 feet below original grade into firm competent soil/rock shall be approved by a Geotechnical Engineer. Benches shall be cut into original grade after the keyway has been nearly filled with compacted engineered fill. Benches shall be constructed into original slope grade as filling proceeds every 2 feet vertically, to remove loose soil/rock. Deeper bench depths may be required depending on actual conditions observed during construction. Bench widths will vary depending on the original slope grade and actual bench depth. Buildings shall be set back from the top of slope in accordance with CBC requirements. Alternatively, deep foundations such as pier-and-grade-beam foundations should be anticipated for buildings close to the top of slopes. | Less than significant impact. |
| **Impact GEO-4:** The project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), potentially creating substantial risks to life or property. | Implement MMs GEO-1a and MM GEO-1b. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact GEO-5:** The project would not use septic tanks or alternative wastewater disposal systems. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.6—Greenhouse Gas Emissions** | | |
| **Impact GHG-1:** Implementation of the project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment. | No mitigation is necessary. | *Short-term and long-term impacts* Less than significant impact. |
| **Impact GHG-2:** Implementation of the project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.7—Hazards and Hazardous Materials** | | |
| **Impact HAZ-1:** The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-2:** The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-3:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HAZ-4:** The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact HAZ-5:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.8—Hydrology and Water Quality** | | |
| **Impact HYD-1:** The project may have the potential to violate any water quality standards or waste discharge requirements. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-2:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-3:** The project would not substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial surface runoff, flooding on- or off-site, erosion or siltation on- or off-site. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-4:** The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-5:** The project would not otherwise substantially degrade water quality. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-6:** Development and land use activities contemplated by the proposed project would not place housing or other land uses within a 100-year flood hazard area as mapped on a federal Flood Insurance Rate Map nor place structures within a 100-year flood zone which would impede or redirect flood flows. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact HYD-7:** The project would not 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. | No mitigation is necessary. | Less than significant impact. |
| **Impact HYD-8:** The project would not be inundation by seiche, tsunami, or mudflow. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.9—Land Use and Planning** | | |
| **Impact LUP-1:** The project would not physically divide an established community. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-2:** The project would not conflict with any applicable provisions of the Pleasanton General Plan, the Urban Growth Boundary, or the Happy Valley Specific Plan, adopted for the purpose of avoiding or mitigating an environmental effect. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-3:** The project would not conflict with any applicable provisions of the Pleasanton Municipal Code, or Measures PP and QQ, adopted for the purpose of avoiding or mitigating an environmental effect. | No mitigation is necessary. | Less than significant impact. |
| **Impact LUP-4:** The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.10—Noise** | | |
| **Impact NOI-1:** The project would not generate or expose persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. | *Short-term impacts*<br>**MM NOI-1:** In addition to requiring that all project developers comply with the applicable construction noise exposure criteria established within the City's Municipal Code 9.04.100, the City shall require developers on the potential sites for rezoning to implement construction best management practices to reduce construction noise, including:<br>• The construction contractor shall ensure that all equipment driven by | *Short-term impacts*<br>Less than significant impact.<br><br>*Long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.<br>• The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.<br>• The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.<br>• At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.<br>• The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.<br>• The construction contractor shall ensure that all on-site construction activities, including deliveries and engine warm-up, shall be restricted to the hours of 8:00 a.m. to 8:00 p.m. daily, except Sunday and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration or repair activities.<br><br>*Long-term impacts*<br>No mitigation is necessary. | |
| **Impact NOI-2:** The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Impact NOI-3:** The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact NOI-4:** The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>Less than significant impact. |
| **Impact NOI-5:** The project would not be 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. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>No impact. |
| **Impact NOI-6:** The project would not be located within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels. | *Short-term and long-term impacts*<br>No mitigation is necessary. | *Short-term and long-term impacts*<br>No impact. |
| **Section 3.11—Public Services** | | |
| **Impact PS-1:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-2:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact PS-3:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-4:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks. | No mitigation is necessary. | Less than significant impact. |
| **Impact PS-5:** The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities. | No mitigation is necessary. | Less than significant impact. |
| **Section 3.12—Transportation and Traffic** | | |
| **Impact TRANS-1:** The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing With Project Conditions. | **MM TRANS-1:** Prior to the commencement of construction, the project applicant shall retain a qualified transportation consultant to prepare and submit a construction traffic management plan to the City of Pleasanton for review and approval. The plan shall include the following elements:<br>• Project staging plan to maximize on-site storage of materials and equipment | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | • A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes<br>• Permitted construction hours<br>• Location of construction staging<br>• Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations<br>• Provisions for street sweeping to remove construction related debris on public streets | |
| **Impact TRANS-2:** The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Near-Term With Project Conditions. | No mitigation is necessary. | Less than significant impact. |
| **Impact TRANS-3:** The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Cumulative With Project Conditions. | **MM TRANS-3:** Prior to issuance of building permits, the applicant shall pay all adopted local and regional transportation impact fees in accordance with the City's Development Impact Fee Program. | Less than significant impact. |
| **Impact TRANS-4:** The project may 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. | Implement Mitigation Measure TRANS-3. | Less than significant impact. |
| **Impact TRANS-5:** The project may substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment). | **MM TRANS-5a:** Prior to issuance of building permits, the project applicant shall:<br>• Install traffic calming measures along Alisal Street at Sycamore Road and at Alisal Court that are consistent with the rural nature of the roadway, subject to the review and approval of the Director of Community Development. Measures that could be considered include roundabouts, traffic circles, additional pavement markings, speed lumps and radar speed signs. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| | **MM TRANS-5b:** Prior to issuance of building permits, the project applicant shall submit site plans that show:<br>• Either revise the project plans to reduce the number of direct private driveway connections to Clubhouse Drive through the project site, or provide other measures acceptable to City of Pleasanton Traffic Engineering that would reduce potential conflicts between vehicles exiting driveways and traffic on Clubhouse Drive ; and<br>• Provide sidewalks with a landscape buffer on both sides of the street | |
| **Impact TRANS-6:** The project would not result in inadequate emergency access. | No mitigation is necessary. | Less than significant impact. |
| **Impact TRANS-7:** The project may conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities. | **MM TRANS-7:** Prior to issuance of building permits, the project applicant shall submit site plans that would be consistent with the intent of the planned network shown in the Draft Trails Master Plan and Happy Valley Specific Plan, including one or more north-south connections through the project, or an alternative trail connection determined by the City to be equivalent, to that connection. All trails shall be designed as required for the applicable facility type in the Draft Trails Master Plan. Show all proposed trail designs are consistent with the Trails Master Plan. The site plans shall show that pedestrian and bicycle connections are provided from cul-de-sacs to adjacent streets where applicable, such as at the new Westbridge Lane cul-de-sac, and there are no conflicts with General Plan Policy 7, Program 7.3. In addition, trail construction shall be completed prior to issuance of occupancy permits. | Less than significant impact. |
| **Section 3.13—Tribal Cultural Resources** | | |
| **Impact TCR-1:** The project would not cause a substantial adverse change in the significance of a tribal cultural resource 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), | No mitigation is necessary. | No impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact TCR-2:** The project would not cause a substantial adverse change in the significance of a tribal cultural 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 Resources Code Section 5024.1. | No mitigation is necessary. | No impact. |
| **Section 3.14—Utilities and Service Systems** | | |
| **Impact USS-1:** The proposed project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-2:** The proposed project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-3:** The proposed project would not create a need for new or expanded downstream storm drainage facilities. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-4:** The proposed project would be served with adequate water supplies and would not require additional entitlements or the construction or expansion of water facilities. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-5:** The project would result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-6:** The project would be served with adequate landfill capacity. | No mitigation is necessary. | Less than significant impact. |

## Table ES-1 (cont.): Executive Summary Matrix

| Impacts | Mitigation Measures | Level of Significance After Mitigation |
|---|---|---|
| **Impact USS-7:** The project would comply with federal, state, and local statutes and regulations related to solid waste. | No mitigation is necessary. | Less than significant impact. |
| **Impact USS-8:** The project would not result in the inefficient, unnecessary, or wasteful use of energy. | No mitigation is necessary. | Less than significant impact. |

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# SECTION 1: INTRODUCTION

## 1.1 - Overview of the CEQA Process

This Draft Subsequent Environmental Impact Report (Draft SEIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Spotorno Ranch Project (State Clearinghouse No. 2017042032). Development of the project site was previously considered in the Happy Valley Specific Plan (HVSP) FEIR, which was certified by the City in 1998. This SEIR evaluates the project in light of the level of development assumed in the HVSP, and discloses where the project as currently proposed would result in new or more severe potential impacts than those evaluated and disclosed in the 1998 HVSP FEIR.

This document is prepared in conformance with CEQA (California Public Resources Code, Section 21000, et seq.) and the CEQA Guidelines (California Code of Regulations, Title 14, Section 15000, et seq.). This Draft SEIR is intended to serve as an informational document for the public agency decision makers and the public regarding the proposed project.

### 1.1.1 - Overview

The proposed Spotorno Ranch Project (project) consists of development of 39 single-family housing units on an approximately 154-acre site in the southern portion of the City of Pleasanton.

The project site is made up of Lots 97 (43 acres) and 98 (111 acres) of the HVSP (see Exhibit 2-14 in Section 2, Project Description). The proposed residences would be constructed on an approximately 31-acre portion of Lot 98; the remaining 80 acres would be zoned Planned Unit Development-Agriculture-Open Space (PUD-A/OS) and the applicant proposes to record a conservation easement over this acreage. In addition, the project includes an amendment to the HVSP to change the residential density of the development site from Planned Unit Development-Semi-Rural Residential (PUD-SRDR) to Planned Unit Development-Low Density Residential (PUD-LDR). An amendment to the HVSP to eliminate the proposed Bypass Road included as part of the HVSP circulation plan, is also proposed.

On Lot 97 and a small portion of Lot 98, the approximately 15 acres designated by the HVSP for Planned Unit Development—Medium Density Residential (PUD-MDR) would be changed to Planned Unit Development-Agriculture/Open Space (PUD-A/OS) (see Exhibits 2-14 and 2-15 in Section 2.0, Project Description). The remaining acreage in Lot 97 would maintain its PUD-A/OS zoning, and the Spotorno Family would retain the entirety of Lot 97.

Section 2, Project Description provides a complete description of the project.

### 1.1.2 - Purpose and Authority

This Draft SEIR provides project-level analysis of the environmental effects related to implementation of the project. The level of impact analysis in this Draft SEIR corresponds to the

degree of specificity deemed appropriate in accordance with CEQA Guidelines (Title 14, Cal. Code Regs., 15146). This document addresses the potentially significant adverse environmental effects that may be associated with the planning, construction, and operation of the project. The document also identifies appropriate and feasible mitigation measures and alternatives that may be adopted to significantly reduce or avoid these potential impacts.

Because the City certified a FEIR for the HVSP (1998), this SEIR evaluates whether the project as currently proposed would result in new or more severe potential impacts than were evaluated and disclosed in the HVSP FEIR. The mitigation measures from the HVSP FEIR, where applicable, are carried forward and would be applied to the project if approved.

CEQA requires that an SEIR contain, at a minimum, certain specific elements. These elements are contained in this Draft SEIR and include:

- Table of Contents
- Executive Summary
- Introduction
- Project Description
- Environmental Setting, Significant Environmental Impacts, and Mitigation Measures
- Cumulative Impacts
- Significant Unavoidable Adverse Impacts
- Alternatives to the Proposed Project
- Growth-Inducing Impacts
- Effects Found not to be Significant
- Areas of Known Controversy

### 1.1.3 - Lead Agency Determination

The City of Pleasanton is designated as the lead agency for the project. CEQA Guidelines Section 15367 defines the lead agency as ". . . the public agency, which has the principal responsibility for carrying out or approving a project." Other public agencies may use this Draft SEIR in the decision-making or permit process and consider the information in this Draft SEIR along with other information that may be presented during the CEQA process.

This Draft SEIR was prepared by FirstCarbon Solutions, an environmental consultant. Prior to public review, it was extensively reviewed and evaluated by the City of Pleasanton. This Draft SEIR reflects the independent judgment and analysis of the City of Pleasanton as required by CEQA. Lists of organizations and persons consulted and the report preparation personnel is provided in Section 8 of this Draft SEIR, respectively.

## 1.2 - Scope of the SEIR

This Draft SEIR addresses the potential environmental effects of the proposed project. The City of Pleasanton issued a Notice of Preparation (NOP) for the proposed project on April 7, 2017, which circulated between April 7, 2017 and May 8, 2017 for the statutory 30-day public review period. The scope of this Draft SEIR includes the potential environmental impacts identified in the NOP and

issues raised by agencies and the public in response to the NOP. The NOP is contained in Appendix A of this Draft SEIR.

Twelve comment letters were received in response to the NOP during the 30-day scoping period. They are listed in Table 1-1 and provided in Appendix A of this Draft SEIR.

**Table 1-1: IS-NOP Comment Letters**

| Agency/Organization | Author | Date | Summary of Relevant Comments |
|---|---|---|---|
| **Public Agencies** | | | |
| Native American Heritage Commission | Frank Lienert Associate Governmental Program Analyst | May 4, 2017 | The NAHC recommends consulting with California Native American tribes in order to avoid inadvertent discoveries of Native American human remains and best practices to protect tribal cultural resources. Project applicant must comply with Assembly Bill 52 and Senate Bill 18. |
| Alameda County Transportation Commission | Saravana Suthanthira Principal Transportation Planner | May 3, 2017 | The letter states that the project is exempt from review under the Congestion Management Program Land Use Analysis Program. |
| **Individuals** | | | |
| Robin Boggs | Resident | April 26, 2017 | Traffic impacts to Sycamore Road and local roadway safety concerns. Recommends the City build a Bypass Road to alleviate congestion. |
| Tim and Barbara Dagget | Resident | April 23, 2017 | Traffic impacts to Alisal Street and Happy Valley Road, cumulative impacts with respect to land use and other projects. Suggests mitigation to address roadway safety concerns. |
| Dennis Glafkides | Resident | April 25, 2017 | Traffic impacts to Happy Valley Road and surrounding area. Recommends the City build a Bypass Road. Concern for utilities services for new development and water quality. |

## Table 1-1 (cont.): IS-NOP Comment Letters

| Agency/Organization | Author | Date | Summary of Relevant Comments |
|---|---|---|---|
| Carmen Jung | Resident | April 25, 2017 | Traffic impacts to Sycamore Road, Sunol Boulevard, and First Street. Local roadway safety concerns and cumulative impacts attributed to new development. |
| Daniel Marks | Individual | February 26, 2017 | Amendment to City General Plan and amendment to Happy Valley Specific Plan. Traffic impacts to Alisal Street and mitigation. New development and building footprints. |
| Benjamin Maughan | Resident | February 27, 2017 | Changes to land use. Traffic impacts to Happy Valley Road and Alisal Street, local safety concerns. Suggests City build the Bypass Road. |
| Steve McGinnis | Individual | February 27, 2017 | Concern with project notice and review period. Impacts to biological resources, hazards, land use, public services, traffic, and water resources. Project review and mitigations insufficient. |
| Steve and Darlene Mix | Resident | April 25, 2017 | Changes to Happy Valley Specific Plan. Project inconsistent with existing development and prior agreements. Impacts to biological resources, flooding, traffic, utilities, and water resources. Recommends City build a Bypass Road. |
| Rong Wang | Resident | March 5, 2017 | Traffic impacts and local roadway safety. Suggests City build a Bypass Road. Clarify local planning requirements. |
| Alex V. Spotorno and Family | Property Owner | May 5, 2017 | The proposed trail placement and associated potential safety and security concerns. Expresses overall support for the project. |
| Source: FCS, 2018 | | | |

### 1.2.1 - Environmental Issues Determined not to be Significant

The NOP identified topical areas that were determined not to be significant. An explanation of why each area is determined not to be significant is provided in Section 7, Effects Found not to be Significant. These topical areas are as follows:

- Agriculture
- Mineral Resources
- Population and Housing
- Recreation

In addition, certain subjects with various topical areas were determined not to be significant. Other potentially significant issues are analyzed in these topical areas; however, the following issues are not analyzed:

- Exposure of Schools to Hazardous Materials or Emissions
- Public and Private Airstrips

An explanation of why each issue is determined not to be significant is provided in Section 7, Effects Found not to be Significant.

### 1.2.2 - Potentially Significant Environmental Issues

The NOP found that the following topical areas may contain potentially significant environmental issues that will require further analysis in the SEIR. These sections are as follows:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology
- Greenhouse Gases
- Hazards
- Hydrology
- Land Use
- Noise
- Public Services
- Transportation
- Tribal Cultural Resources
- Utilities

## 1.3 - Organization of the SEIR

This Draft SEIR is organized into the following main sections:

- **Section ES: Executive Summary.** This section includes a summary of the proposed project and alternatives to be addressed in the Draft SEIR. A brief description of the areas of controversy and issues to be resolved, and overview of the Mitigation Monitoring and Reporting Program, in addition to a table that summarizes the impacts, mitigation measures, and level of significance after mitigation, are also included in this section.
- **Section 1: Introduction.** This section provides an introduction and overview describing the purpose of this Draft SEIR, its scope and components, and its review and certification process.

- **Section 2: Project Description.** This section includes a detailed description of the proposed project, including its location, site, and project characteristics. A discussion of the project objectives, intended uses of the Draft SEIR, responsible agencies, and approvals that are needed for the proposed project are also provided.

- **Section 3: Environmental Impact Analysis.** This section analyzes the environmental impacts of the proposed project. Impacts are organized into major topic areas. Each topic area includes a description of the environmental setting, methodology, significance criteria, impacts, mitigation measures, and significance after mitigation. The specific environmental topics that are addressed within Section 3 are as follows:
  - **Section 3.1—Aesthetics, Light, and Glare:** Addresses the potential visual impacts of development intensification and the overall increase in illumination produced by the project.
  - **Section 3.2—Air Quality:** Addresses the potential air quality impacts associated with project implementation, as well as consistency with the Bay Area Air Quality Management District 2017 Clean Air Plan. In addition, the section also evaluates project emissions of greenhouse gases.
  - **Section 3.3—Biological Resources:** Addresses the project's potential impacts on habitat, vegetation, and wildlife; the potential degradation or elimination of important habitat; and impacts on listed, proposed, and candidate threatened and endangered species.
  - **Section 3.4—Cultural Resources:** Addresses potential impacts on historical resources, archaeological resources, paleontological resources, and burial sites.
  - **Section 3.5—Geology, Soils, and Seismicity:** Addresses the potential impacts the project may have on soils and assesses the effects of project development in relation to geologic and seismic conditions.
  - **Section 3.6—Greenhouse Gas Emissions:** Addresses the potential project emissions of Greenhouse Gases.
  - **Section 3.7—Hazards and Hazardous Materials:** Addresses the potential for the presence of hazardous materials or conditions on the project site and in the project area that may have the potential to impact human health.
  - **Section 3.8—Hydrology and Water Quality:** Addresses the potential impacts of the project on local hydrological conditions, including drainage areas, and changes in the flow rates.
  - **Section 3.9—Land Use and Planning:** Addresses the potential land use impacts associated with division of an established community and consistency with the Happy Valley Specific Plan.
  - **Section 3.10—Noise:** Addresses the potential noise impacts during construction and at project buildout from mobile and stationary sources. The section also addresses the impact of noise generation on neighboring uses.
  - **Section 3.11—Public Services:** Addresses the potential impacts upon public services, including fire protection, law enforcement, schools, parks, and recreational facilities.
  - **Section 3.12–Transportation and Traffic:** Addresses the impacts on the local and regional roadway system, public transportation, bicycle, and pedestrian access.
  - **Section 3.13—Tribal Cultural Resources:** Addresses potential impacts on tribal cultural resources.

- **Section 3.14—Utilities and Services Systems:** Addresses the potential impacts upon service providers, including fire protection, law enforcement, water supply, wastewater, solid waste, and energy providers.

- **Section 4: Cumulative Effects.** This section discusses the cumulative impacts associated with the proposed project, including the impacts of past, present, and probable future projects.
- **Section 5: Alternatives to the Proposed Project.** This section compares the impacts of the proposed project with three land-use project alternatives: the No Project Alternative, the 22 Lot Development on Spotorno Flat Area Alternative, and the 39 Units With Construction of The Bypass Road Alternative. An environmentally superior alternative is identified. In addition, alternatives initially considered but rejected from further consideration are discussed.
- **Section 6: Other CEQA Considerations.** This section provides a summary of significant environmental impacts, including unavoidable and growth-inducing impacts. This section discusses the cumulative impacts associated with the proposed project, including the impacts of past, present, and probable future projects. In addition, the proposed project's energy demand is discussed.
- **Section 7: Effects Found not to be Significant.** This section contains analysis of the topical sections not addressed in Section 3.
- **Section 8: Persons and Organizations Consulted/List of Preparers.** This section also contains a full list of persons and organizations that were consulted during the preparation of this Draft SEIR. This section also contains a full list of the authors who assisted in the preparation of the Draft SEIR, by name and affiliation.
- **Section 9: References.** This section contains a full list of references that were used in the preparation of this Draft SEIR.
- **Appendices.** This section includes all notices and other procedural documents pertinent to the Draft SEIR, as well as all technical material prepared to support the analysis.

## 1.4 - Documents Incorporated by Reference

As permitted by CEQA Guidelines Section 15150, this Draft SEIR has referenced several technical studies, analyses, and previously certified environmental documentation. Information from the documents, which have been incorporated by reference, has been briefly summarized in the appropriate section(s). The relationship between the incorporated part of the referenced document and the Draft SEIR has also been described. The documents and other sources that have been used in the preparation of this Draft SEIR include but are not limited to:

- The City of Pleasanton 2005–2025 General Plan
- The City of Pleasanton 2005–2025 General Plan Draft Environmental Impact Report
- Happy Valley Specific Plan
- Happy Valley Specific Plan Draft and Final Environmental Impact Reports

These documents are specifically identified in Section 9, References, of this Draft SEIR. In accordance with CEQA Guidelines Section 15150(b), the General Plan, the Happy Valley Specific Plan,

and the referenced documents and other sources used in the preparation of the Draft SEIR are available for review at the City of Pleasanton at the address shown in Section 1.6 below.

## 1.5 - Documents Prepared for the Project

The following technical studies and analyses were prepared for the proposed project:

- Air Quality/Greenhouse Gas Emissions Analysis
- Biological Resources Analysis
- Noise Analysis
- Phase I Cultural and Paleontological Resources Assessment
- Phase I Environmental Site Assessment
- Spotorno Property Transportation Assessment
- Spotorno Draft Visual Simulations

## 1.6 - Review of the Draft SEIR

Upon completion of the Draft SEIR, the City of Pleasanton filed a Notice of Completion (NOC) with the State Office of Planning and Research to begin the public review period (Public Resources Code, Section 21161). Concurrent with the NOC, this Draft SEIR has been distributed to responsible and trustee agencies, other affected agencies, surrounding cities, and interested parties, as well as all parties requesting a copy of the Draft SEIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft SEIR, including the technical appendices, is available for review at the City of Pleasanton, Community Development Department and Library. The address for each location is provided below:

City of Pleasanton, Community
Development Department
200 Old Bernal Avenue
Pleasanton, CA 94566

City of Pleasanton, Library
400 Old Bernal Avenue
Pleasanton, CA 94566

Agencies, organizations, and interested parties have the opportunity to comment on the Draft SEIR during the 45-day public review period. Written comments on this Draft SEIR should be addressed to:

Jenny Soo, Associate Planner
City of Pleasanton
200 Old Bernal Avenue
Pleasanton, CA 94566
Email: jsoo@cityofpleasantonca.gov
925.931.5600

Submittal of electronic comments in Microsoft Word or Adobe PDF format is encouraged. Upon completion of the public review period, written responses to all significant environmental issues raised will be prepared and made available for review by the commenting agencies at least 10 days prior to the public hearing before the City of Pleasanton on the project, at which the certification of the Final SEIR will be considered. Comments received and the responses to comments will be included as part of the record for consideration by decision makers for the project.

# SECTION 2: PROJECT DESCRIPTION

## 2.1 - Introduction

The project site, approximately 154 acres in area, is located in the Happy Valley Area, referred to as Lot 97 (Assessor's Parcel Number [APN] 948-152-1) and Lot 98 (APN 949-16-6) by the Happy Valley Specific Plan (HVSP). The project consists of a proposal to develop 39 single-family detached homes and related on- and off-site improvements on approximately 31 acres (known as the Spotorno Flat Area by HVSP) of the 154-acre site.[1] Approximately 80 acres of the remaining 124 acres is proposed to remain as permanent agricultural open space and would be designated/zoned Agricultural and Grazing (A/OS). The Spotorno family would retain the remaining acreage.

The project includes amendments to the Happy Valley Specific Plan (HVSP), among other project approvals, to change the residential density of the Spotorno Flat Area to accommodate clustered development, and eliminate the Bypass Road from the circulation network included in the HVSP.

This Subsequent Draft Environmental Impact Report (SEIR) has been completed in accordance with the California Environmental Quality Act (CEQA). CEQA requires that state and local public agencies analyze proposed projects to determine potential impacts on the environment and disclose any such impacts. The details of this section have been written to describe the features of the project consistent with the CEQA Guidelines.

## 2.2 - Project Location and Setting

### 2.2.1 - Physical Setting

The project site is located in the southern portion of the City of Pleasanton, Alameda County, California), within the HVSP area. The HVSP area is an 860-acre area located generally east of Interstate 680 and south of Sycamore Road. The HVSP area consists of five key components: the golf course properties, the Spotorno Upper Valley Area, the Spotorno Flat Area, the Greater Happy Valley Area, and Agriculture/Open Space Area as shown on Exhibit 2-1.

As shown in Exhibit 2-2, the 154-acre subject property is located within the Happy Valley Area and is roughly bounded by Alisal Street on the west, Westbridge Lane and Faith Chapel Assembly of God to the south and undeveloped hills to the east and north. The topography of the project site varies, with hills and ridgelines in the northern and eastern portions of the site (Spotorno Hill) and flat terrain in the southwest (Spotorno Flat Area). The City's Urban Growth Boundary (UGB) generally aligns with the eastern boundary of the Spotorno Flat Area (Exhibit 2-2). The eastern (Spotorno Hill) portion of the 154-acre property is located outside the UGB line but within the city limits.

Current vehicular access to the site is from Interstate 680 (I-680), via Happy Valley Road or Sycamore Road to a gated access point on Alisal Street near the Faith Chapel Assembly of God Church.

[1] The Spotorno Flat Area is noted as 33 acres in the Happy Valley Specific Plan. The Spotorno Ranch Project proposes to develop 31 acres of this 33-acre area, based on civil engineering plans for the vesting tentative map.

### Surrounding Area

Surrounding land uses include large lot rural residential uses to the west, northwest, and southwest; the Faith Chapel Assembly of God Church to the southwest; the Callippe Preserve Golf Course and single-family residential uses to the south, and open space to the east.

#### *West*

The project site is bounded by Alisal Street, large-lot rural residential properties, and undeveloped land that spans further west. Existing trees are located sparsely along west side of Alisal Street, and the undeveloped land mostly consists of grasslands. Alisal Street and properties to the west of Alisal Street are located in unincorporated Alameda County.

#### *North*

Directly to the north of the Spotorno Flat Area are single-family residential properties that were recently annexed to the City. Large-lot residential properties are located along the northwest boundary of the project site, and extend north from the Spotorno Upper Valley Area. The northernmost portion of the project site is located adjacent to Minnie Street (a private street providing access to and from the Spotorno Residence) and is near a low-density, single-family residential neighborhood located on Sycamore Creek Way. A city water tank is located to the vicinity to north and serves the neighborhoods north of the project site. To the north and northeast of this water tank is hilly, open space grasslands. The City has recently approved a low-density residential development which has not yet been constructed.

#### *East*

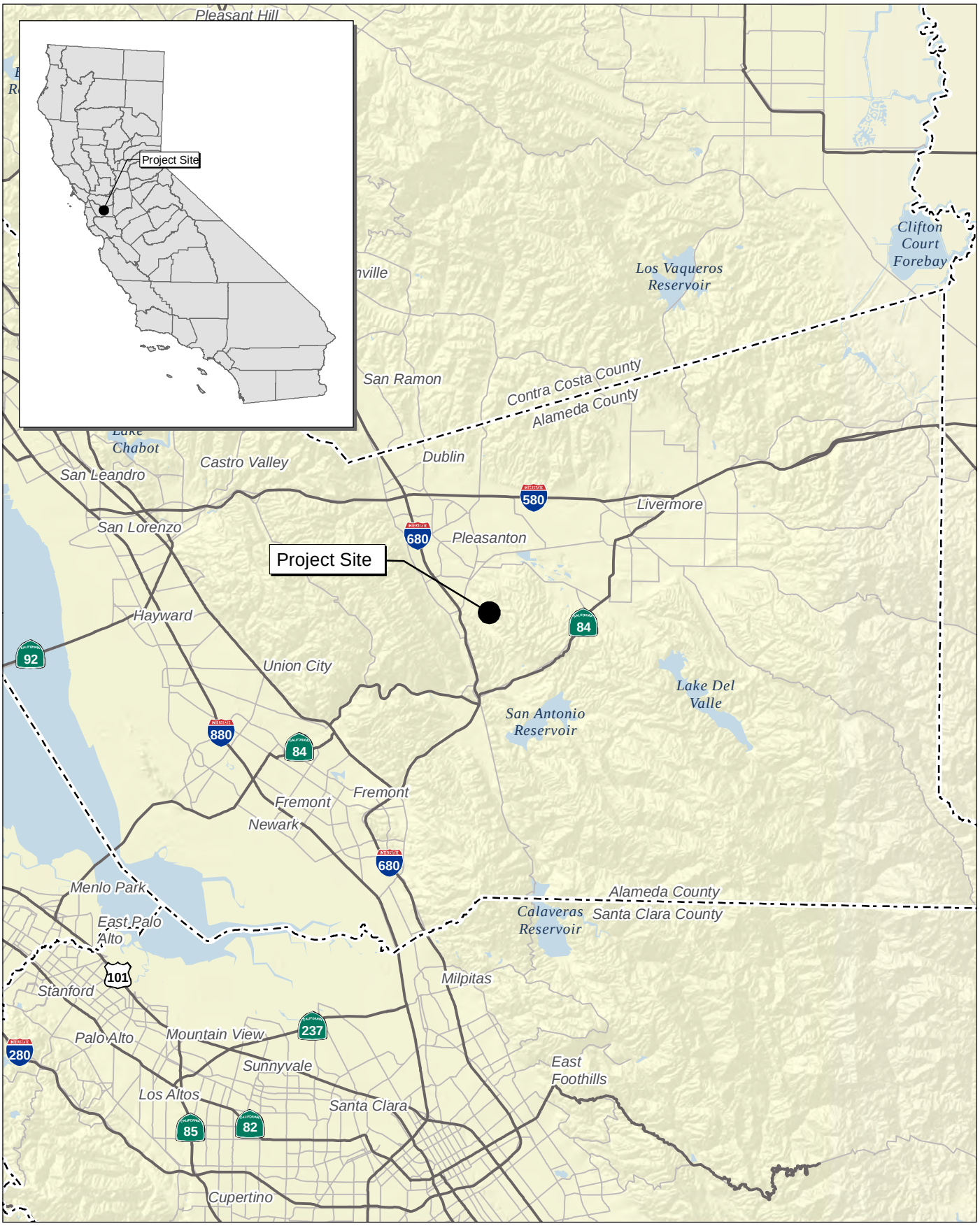
The area to the east of the project site predominantly consists of open space grasslands within hilly terrain and scattered oak trees along the ridgetops and clustered within ravines. This area is located outside the City's UGB line. A City water tank is located slightly northeast of the project site.

#### *South*

The project site is bounded to the south by Westbridge Lane and Faith Chapel Assembly of God church. The City's Callippe Preserve Golf Course is located directly south of Westbridge Lane, wrapping around six residential lots that face onto Westbridge Lane. Adjacent land uses to the southeast include four residential properties near the intersection of Westbridge Lane and Clubhouse Drive.

## 2.2.2 - Site Conditions

The project site is generally undeveloped and dominated by mature vegetation and nonnative and native grasslands. The southwestern portion of the site (approximately 31 acres) contains flat terrain that is mowed and tilled on a regular basis, while the northern and eastern portions of the site (approximately 124 acres) contains hilly terrain. The hilly portion of the site is regularly used for grazing. The project site is enclosed with a barbed-wire fence; a gated access point is located near the Faith Chapel Assembly of God church.




Source: Census 2000 Data, The CaSIL.

FIRSTCARBON SOLUTIONS™

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Exhibit 2-1
Regional Location Map

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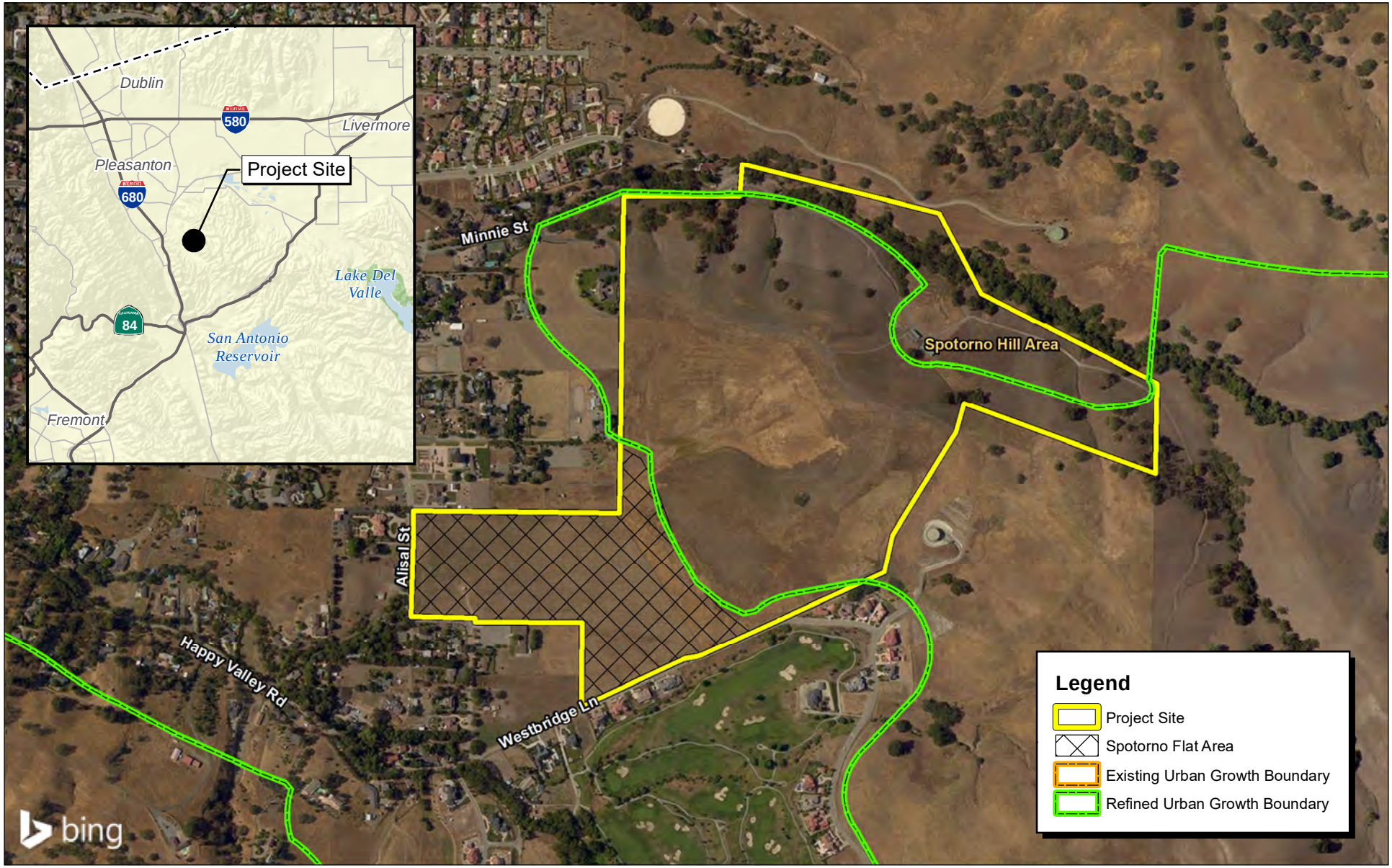


Source: bing Aerial Imagery. Ruggeri, Jensen, Azar, 2015. City of Pleasanton GIS Data.

FIRSTCARBON SOLUTIONS™

850 425 0 850 Feet

Exhibit 2-2

Project Vicinity with Refined Urban Growth Boundary

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An approximately 20-foot-tall wood windmill is located within the Spotorno Flat Area. The windmill powers an irrigation well to irrigate the property for existing cattle grazing. Located in the east portion of the project site, over the crest of the hilly terrain, are five ancillary structures (per aerial). A residence located adjacent to the far northern edge of the project site, is on Lot 96 of HVSP which is not part of this project.

Elevations on the project site range from approximately 380 feet above mean sea level (msl) within the Spotorno Flat Area of the project site to approximately 736 feet above msl at the crest of the hills east of Spotorno Flat Area. Exhibit 2-3 demonstrates the slopes in the Spotorno Flat Area portion of the project site. Scattered oak trees are located along the ridgetops and clustered within ravines. There are four wetlands within the project site, one within the Spotorno Flat Area adjacent to Alisal Street and three that are located at the base of the hillside as it slopes upwards from Spotorno Flat Area.

## 2.2.3 - Planning Setting

### City of Pleasanton General Plan

The City General Plan is the policy document that guides the long-range development of land and the conservation of resources in Pleasanton, and with which all other city ordinances and policies must be consistent.

The City adopted the current General Plan 2005-2025 in July 2009. The Housing Element was amended and adopted in 2015. The 2005–2025 General Plan designates the project site as Low Density Residential, Medium Density Residential and Open Space—Public Health and Safety.

### Happy Valley Specific Plan

Seven specific plans have been adopted for various areas of the City and portions of the unincorporated area around Pleasanton as a tool to systematically implement the General Plan. These specific plans (1) act as statements of planning policy that refine the General Plan policies applicable to a defined area, (2) direct regulating land use; and (3) bring together detailed policies and regulations into a focused development scheme. The entirety of the project site is located within the Happy Valley Specific Plan (HVSP) area.

The HVSP was adopted by the City in 1998 with the intent to develop a municipal golf course; provide infrastructure opportunities for the planning area residents, and to balance the concerns of those wishing to develop their properties with those wishing to retain the existing semi-rural characteristics of the area.[2] The project site is referred to by the HVSP as Spotorno Upper Valley Medium density Residential Subarea, Spotorno Flat Area, and Agricultural/Open Space Subarea. The HVSP was developed in a process that drew from the following sources: (1) the City's General Plan; (2) recommendations of the Happy Valley property owners and residents; (3) recommendations of the City's Golf Course Committee; and (4) recommendations from City staff and environmental consultants. A key concern during the development of the Specific Plan was the retention of the rural characteristics of the HVSP area. A Draft EIR was prepared to analyze the impacts from adopting the

[2] City of Pleasanton. 1998. HVSP. Page 1.

Plan (State Clearinghouse No. 97032034; February 1998). The City held a public hearing on June 16, 1998, and adopted the HVSP Final EIR, the HVSP, and related amendments to the City's General Plan.

The HVSP provided for the development of a maximum of 183 new residences within the planning area and the construction of a "Bypass Road" linking Westbridge Lane with Sycamore Creek Way, to provide access and utilities to 75 lots in the Spotorno Hill area and to divert golf-course and residential traffic from Happy Valley Road, a County-owned and maintained two-lane frontage road. The HVSP required the construction of a Bypass Road with development of the Spotorno site. The HVSP envisions that, once constructed, Westbridge Lane would be restricted for through traffic, with a barrier located approximately at 2215 Westbridge Lane.

The HVSP designated the Bypass Road location. In 2007, a 12-member Happy Valley Blue Ribbon Committee, after one-year of review and collaboration, recommended—and the City Council accepted—a preferred alternative for a Bypass Road alignment to the City Council.

Water, sewer, and other utility systems were extended into the parts of the HVSP planning area as part of the golf course development to provide the golf course facility and golf course properties with connections to the City's system. The service area boundaries of other public services (e.g., police and fire) were also extended into parts of the HVSP area that are located within the city limits.

The project site is identified as Lots 97 and 98 in the HVSP. Exhibit 2-14 depicts the current HVSP zoning/land use designations for the project site:

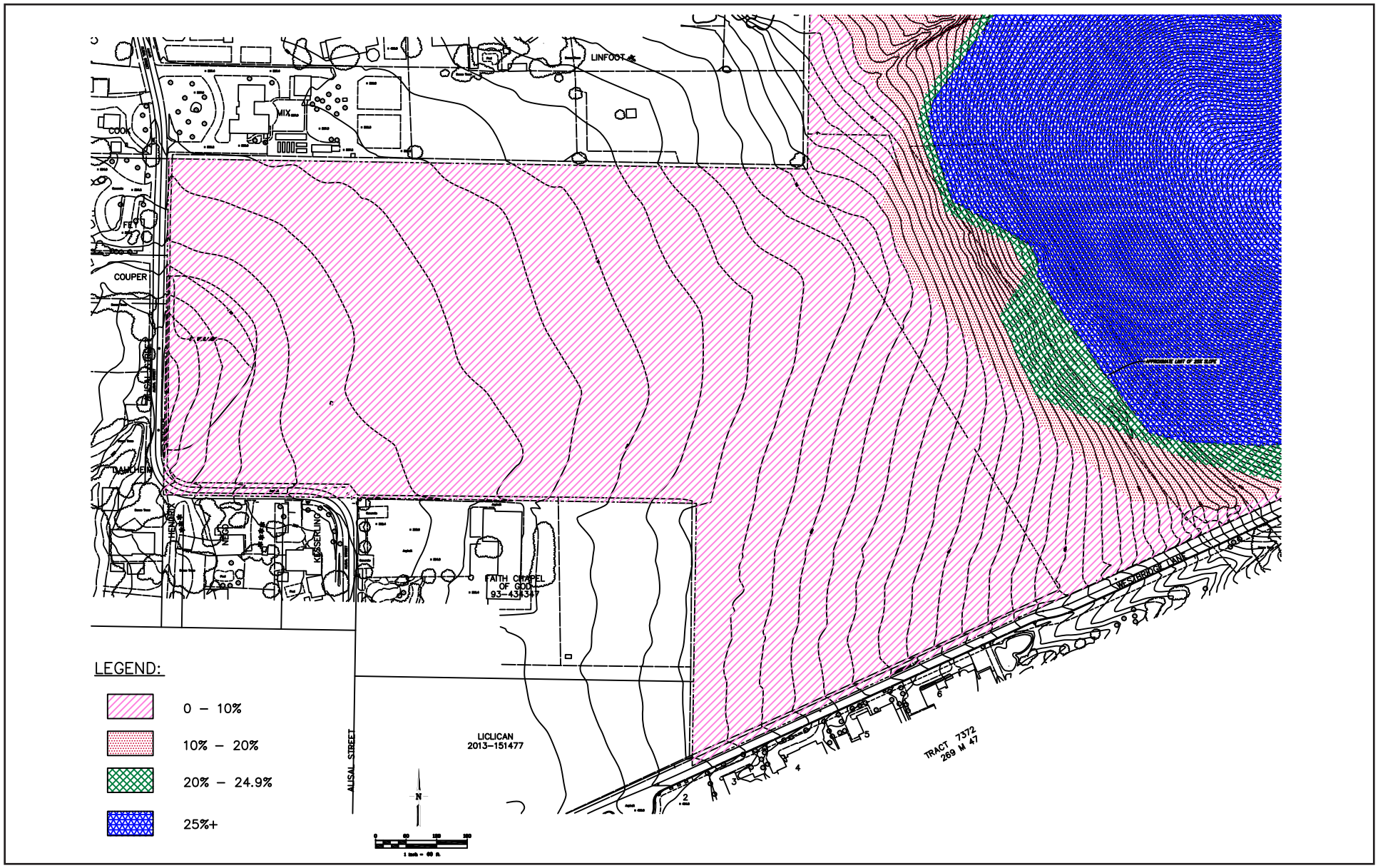
- Planned Unit Development—Semi-Rural Density Residential (PUD-SRDR), on the Spotorno Flat Area of Lot 98. This designation allows for one dwelling unit per 1.5 acres, equivalent to 22 dwelling units;
- Planned Unit Development—Medium Density Residential (PUD-MDR) District (up to 75 dwelling units). This designation covers the a 15-acre portion of the Spotorno Upper Valley Area, which is located primarily on Lot 97 and a small portion of Lot 98;
- The remainder of the site is zoned/designated Planned Unit Development—Agriculture/Open Space (PUD-A/OS).

In November 2008, Pleasanton voters approved two initiatives, Measure PP and Measure QQ, which among other aspects limit development of steep hillside areas. To accommodate the proposed project and to remain consistent with these voter measures, amendments to the HVSP are proposed and will be considered in conjunction with the Spotorno Ranch Project, including changes to the zoning/land use designations and circulation envisioned in the Specific Plan. The following section outlines those measures and proposed Specific Plan amendments.

## Relevant City of Pleasanton Planning Initiatives

### *Measure FF*

In November 1996, the voters of the City of Pleasanton approved Measure FF, requiring voter approval for all but minor refinements to the City's UGB. Areas outside the UGB line are generally suitable for the long-term protection of natural resources, large-lot agriculture and grazing, parks, and recreation, and similar uses. General Plan Land Use Element Policy 22 does not allow urban development beyond the UGB line.




Source: Ruggeri-Jensen-Azar, February 2018.

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Exhibit 2-3
Project Site Slope Classification Map

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Measure FF indicates that the southern location of the UGB line in Happy Valley is based on the physical terrain as it extends along the base of the steep hills that enclose the Happy Valley area. The 1996 Measure FF description of the UGB line, which corresponds to the base of the steep hills that enclose Happy Valley, would include the base of Spotorno Hill. (The voter-affirmed UGB map did not include any parcel lines, and it was mapped at a 3,000-foot to 1-inch scale that makes it challenging to precisely locate on a parcel map.) When the City updated its General Plan in 2005, a different mapping program was used, which plotted a slightly different UGB location on the project site. Consequently, the UGB line shown on the General Plan Land Use Map is proposed to be refined as shown in Exhibit 2-2, through a minor UGB refinement, to more accurately correspond to the text in Measure FF. Measure FF includes the following language as it relates to the UGB line: "The UGB to the south is based on physical terrain as it extends along the base of the steep hills that enclose the Happy Valley area. It is also situated in nearby hilly locations to accommodate future development which has been permitted by the General Plan for many years."

### *Measure PP and Measure QQ*

In November 2008, Pleasanton voters approved two ballot initiatives relating to the City's growth limits and regarding General Plan policy:[3]

1. Measure PP: Save Pleasanton's Hills and Housing Cap, a voter initiative
2. Measure QQ: The Pleasanton Ridgelines Protection and Growth Control Initiative (a City Council measure)

These two measures were incorporated into the 2005–2025 Pleasanton General Plan adopted by the City Council on July 21, 2009.

Measure PP limits the placement of housing units and structures on slopes of 25 percent or greater or within 100 vertical feet of a ridgeline, limits grading on slopes of 25 percent or more or within 100 feet of a ridgeline to build residential or commercial structures, and exempts from these restrictions projects of 10 or fewer housing units on property that constituted a single legal parcel, as of January 1, 2007. Measure PP also limits subdivision of a legal parcel, existing as of January 1, 2007, to approve more than 10 housing units.

Measure QQ reaffirmed and readopted policies in the then existing General Plan to (A) preserve scenic hillside and ridge views of specific ridges; (B) study the feasibility of preserving large open space areas in the Southeast Hills; and(C) protect large contiguous areas designated as Open Space in the General Plan.

As noted, the Spotorno Ranch Project proposes amendments to the HVSP, including rezoning/ redesignation of the Planned Unit Development—Medium Density Residential (PUD-MDR) District (up to 75 dwelling units) to PUD-Ag/Open Space, to bring the project generally into conformance with Measure PP's limitation on a subdivision approving more than 10 housing units, and prohibition on

[3] As subsequent litigation determined that Pleasanton's earlier voter adopted housing cap was in conflict with State law, those portions of Measure PP related to the housing cap are not discussed here.

locating structures on slopes over 25 percent. The project also proposes to eliminate the Bypass Road, as no housing development is proposed in the Upper Spotorno Valley parcel that would use such road.

## 2.3 - Project Objectives

- Create a high quality, single-family residential neighborhood that complements the semi-rural character of Happy Valley;
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped open space with adequate publicly accessible connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent measures PP and QQ.

## 2.4 - Project Components

The applicant is proposing to build 39 single-family homes within the approximately 31-acre portion of the Spotorno Flat Area. All homes would be developed to the standards set forth in the HVSP. The project would require the development of an internal circulation system connecting the project to Alisal Street on the west and Westbridge Lane on the south (including new trails), roadway improvements, landscaping, and bio-retention facilities. The project would permanently preserve approximately 80 acres of Lot 98 of the property as agricultural open space.

The proposal requests an amendment to the HVSP to eliminate the Bypass Road. To provide for adequate circulation, the proposed plan would complete the cul-de-sac on Westbridge Lane by installing bollards or a similar barrier near 2215 Westbridge Lane. Westbridge Lane would no longer allow through traffic (emergency access would continue to be allowed). All golf course neighborhood traffic would travel through the proposed project site to reach Alisal Street. A summary of the project's components is shown in Table 2-1.

**Table 2-1: Summary of Project Components**

| Land Use | Units | Acres | Percent of Site |
|---|---|---|---|
| Single-family Detached Residential Lots | 39 | 23.2 | 15 |
| On-Site Streets | — | 3.07 | 2 |
| Westbridge Lane | — | 0.41 | 0.3 |
| Alisal Street | — | 0.48 | 0.3 |
| Parcel A Open Space including bioretention and wetland preservation | — | 3.39 | 2.2 |
| Parcel B (storm drain area) | — | 0.63 | 0.4 |
| Parcel C (Agricultural Open Space) | — | 80.8 | 52.2 |

**Table 2-1 (cont.): Summary of Project Components**

| Land Use | Units | Acres | Percent of Site |
|---|---|---|---|
| Parcel D (Agricultural Open Space) | — | 42.8 | 27.6 |
| **Total** | **39** | **154.72** | **100** |
| Source: RJA, 2018 | | | |

## 2.4.1 - Residential Development

The project would consist of the development of 39 single-family residences on approximately 31 acres, clustered on the west side of the property (Exhibit 2-4). Lot sizes would range between approximately 15,000 square feet (sf) and approximately 39,000 sf, for an average lot size of approximately 26,000 sf. Each home site would have a minimum front yard setback of 35 feet, with a side yard setback of 20 to 25 feet and a rear yard setback of 35 feet. The maximum building height would not exceed 30 feet. The gross density of the project would be 0.35 dwelling unit per acre (DU/acre).

A minimum of 8 accessory dwelling units (ADUs) would be constructed with the proposed residences. An approximately 3.4-acre undeveloped parcel (Parcel A) in the western portion of the project site that contains wetlands would be preserved from development. The rear of Lots 4-9 would be fenced, to allow the open space area to continue to be used for grazing. The floor area ratio (FAR)[4] for the home sites at the project site would range between approximately 0.09 and 0.24, depending on the number of floors in the home. All home sites would be located outside areas with slopes greater than 25 percent, primarily in areas with slopes of less than 10 percent, with some portions of lots and one of the proposed ADUs shown as extending into areas of 10–20 percent slope.

## 2.4.2 - Open Space, Natural Features, and Landscaping

The project would permanently preserve approximately 80 acres as open space that would continue to be used for agriculture/grazing. The open space would be designated/zoned A/OS with an open space (no development) easement. The open space is located to the northeast and east of Spotorno Flat Area, within the hilly portion of the project site, located east and northeast of the proposed Lots 4-9 along the project street labeled as Clubhouse Drive.

The project area includes four wetlands: three are located in the approximately 124-acre open space area, while a fourth is located within Parcel A, and would also remain undeveloped.

The project would include landscaping around the home sites (Exhibit 2-5) as well as on-site trails (Exhibits 2-6a and 2-6b). No fewer than 200 new trees would be planted,[5] consisting predominantly of red maple (*Acer rubrum*), Marina strawberry (*Arbutus unedo*), white ash (*Fraximus americana*), London plane tree (*Platanus acerifolia*), and coast live oak (*Quercus agrifolia*). These tree species

[4] The FAR includes the house square footage + garage square feet/lot size.
[5] The conceptual landscape plan shows approximately 230 new trees, this number may vary based on the final landscape planting plan).

would require low to medium amounts of water. Groundcover landscaping would consist of three species: parvifolium (*Myoporum parvifolium*), mauve clusters (*Scaevola albida*), sodden native fescues, and native hydroseed. These species all require a low amount of water. Over 30 shrub species are proposed for the home site landscaping, including fortnight lily (*Dietes bicolor*), butterfly bush (*Buddleja davdii*), and catmint (*Nepeta faassenii*). All shrub species would require a minimal amount of watering.

### 2.4.3 - Stormwater

The project site is mostly undeveloped, and stormwater follows natural drainage patterns, either emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolating into groundwater reservoirs.

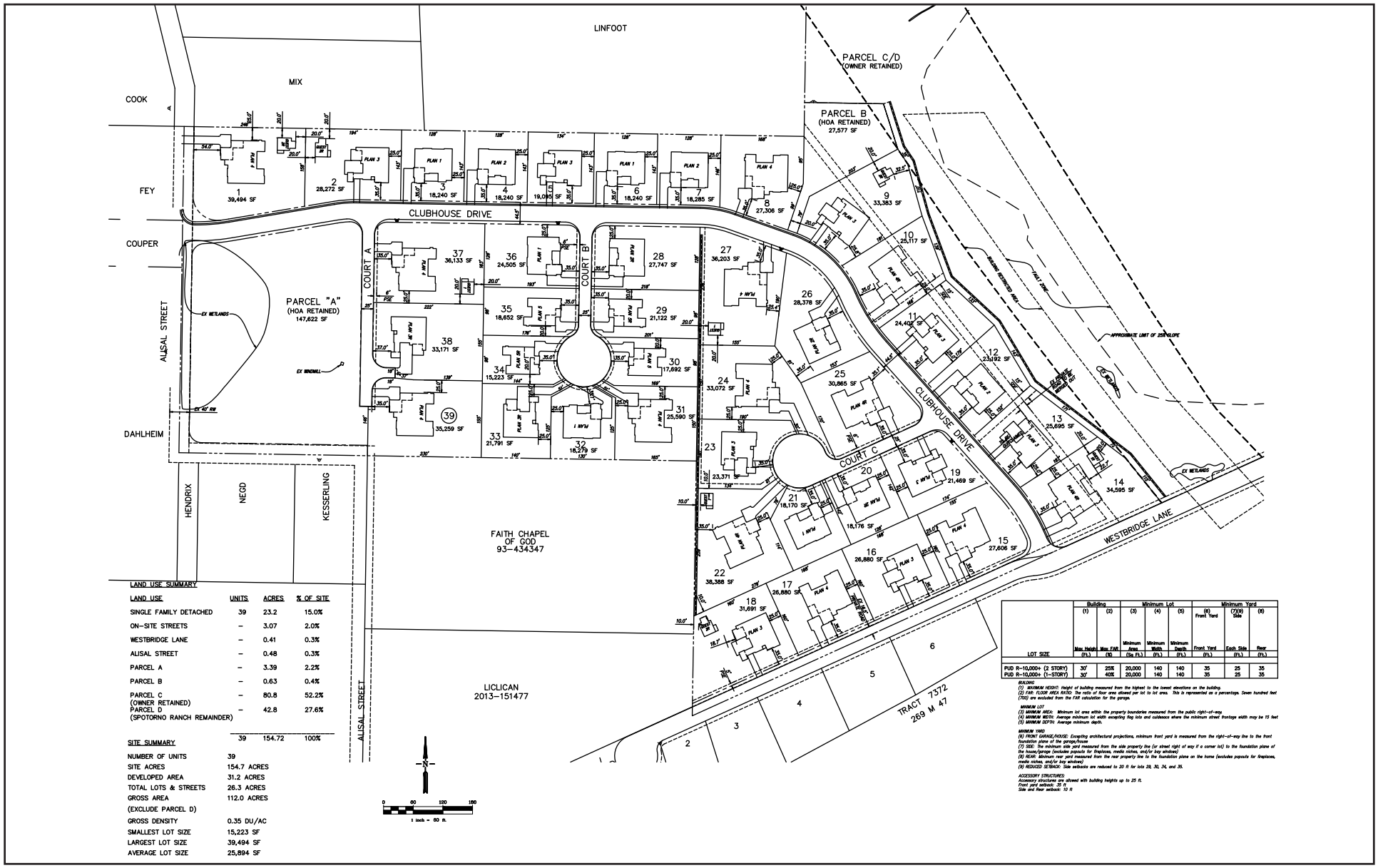
The project is subject to Alameda County Clean Water Program, C.3 Stormwater Technical Guidance provisions and as such will include a series of stormwater treatment facilities. Lots 15–18 (which front onto Westbridge Lane) would be treated by individual on-lot bio-retention planters that would discharge directly to Westbridge Lane via through-curb drains. Lot 1 and the portion of Clubhouse Drive closest to Alisal Street would be treated by bio-retention planters adjacent to Clubhouse Drive. Runoff treated in these facilities would be piped underground as part of the storm drain system. Stormwater drainage from the balance of the lots and on-site streets would be conveyed via underground pipes to the treatment pond on Parcel A. This series of treatment facilities would also serve as flow mitigation devices in accordance with the C.3 Hydromodification (HMP) requirements.

Overall, the project would create approximately 522,130 sf of impervious surface, (calculated as 452,100 sf of impervious surface, i.e., concrete, asphalt paving and rooftops, plus 10% of the approximately 700,300 sf of landscape area [70,030 sf]). In accordance with C.3 requirements, a total of 27,900 sf of bio-retention areas would be constructed to provide on-site treatment of stormwater.

### 2.4.4 - Circulation and Access

The project would be accessed via Alisal Street. Trips that currently travel to the golf course and the surrounding housing via Westbridge Lane would be rerouted to drive through the project area. The cul-de-sac on Westbridge Lane would be completed with the installation of bollards or other barriers to prevent access to Happy Valley Road via Westbridge Lane, other than for emergency vehicles. As shown on Exhibit 2-4, the project site would include one primary street, labelled as Clubhouse Drive, with three “courts” that end in cul-de-sacs. Emergency access would be provided from Clubhouse Drive via a 44.5-foot-wide public street with a trail on one side and shared bike and travel lanes that would be 16 feet wide in each direction. An emergency vehicle access gate would be provided at the cul-de-sac on Westbridge Lane to allow alternate access for emergency vehicles only. A 6-foot-wide golf course loop trail would be constructed along Westbridge Lane. The project’s circulation is shown in the site plan (Exhibit 2-4).

The project would not include the Bypass Road contemplated in the HVSP and proposes to amend the HVSP to reflect the Bypass Road’s elimination.




LAND USE SUMMARY

| LAND USE | UNITS | ACRES | % OF SITE |
|---|---|---|---|
| SINGLE FAMILY DETACHED | 39 | 23.2 | 15.0% |
| ON-SITE STREETS | – | 3.07 | 2.0% |
| WESTBRIDGE LANE | – | 0.41 | 0.3% |
| ALISAL STREET | – | 0.48 | 0.3% |
| PARCEL A | – | 3.39 | 2.2% |
| PARCEL B | – | 0.63 | 0.4% |
| PARCEL C (OWNER RETAINED) | – | 80.8 | 52.2% |
| PARCEL D (SPOTORNO RANCH REMAINDER) | – | 42.8 | 27.6% |
| | 39 | 154.72 | 100% |

SITE SUMMARY

| | |
|---|---|
| NUMBER OF UNITS | 39 |
| SITE ACRES | 154.7 ACRES |
| DEVELOPED AREA | 31.2 ACRES |
| TOTAL LOTS & STREETS | 26.3 ACRES |
| GROSS AREA (EXCLUDE PARCEL D) | 112.0 ACRES |
| GROSS DENSITY | 0.35 DU/AC |
| SMALLEST LOT SIZE | 15,223 SF |
| LARGEST LOT SIZE | 39,494 SF |
| AVERAGE LOT SIZE | 25,894 SF |

| LOT SIZE | Building (1) Max Height (Ft.) | Building (2) Max FAR (%) | Minimum Lot (3) Minimum Area (Sq Ft.) | Minimum Lot (4) Minimum Width (Ft.) | Minimum Lot (5) Minimum Depth (Ft.) | Minimum Yard (6) Front Yard (Ft.) | Minimum Yard (7)(9) Side Each Side (Ft.) | Minimum Yard (8) Rear (Ft.) |
|---|---|---|---|---|---|---|---|---|
| PUD R-10,000+ (2 STORY) | 30' | 25% | 20,000 | 140 | 140 | 35 | 25 | 35 |
| PUD R-10,000+ (1-STORY) | 30' | 40% | 20,000 | 140 | 140 | 35 | 25 | 35 |

BUILDING
(1) MAXIMUM HEIGHT: Height of building measured from the highest to the lowest elevations on the building.
(2) FAR: FLOOR AREA RATIO: The ratio of floor area allowed per lot to lot area. This is represented as a percentage. Seven hundred feet (700) are excluded from the FAR calculation for the garage.

MINIMUM LOT
(3) MINIMUM AREA: Minimum lot area within the property boundaries measured from the public right-of-way.
(4) MINIMUM WIDTH: Average minimum lot width excepting flag lots and cul-de-sacs where the minimum street frontage width may be 15 feet
(5) MINIMUM DEPTH: Average minimum depth.

MINIMUM YARD
(6) FRONT GARAGE/HOUSE: Excepting architectural projections, minimum front yard is measured from the right-of-way line to the front foundation plane of the garage/house
(7) SIDE: The minimum side yard measured from the side property line (or street right of way if a corner lot) to the foundation plane of the house/garage (excludes popouts for fireplaces, media niches, and/or bay windows)
(8) REAR: Minimum rear yard measured from the rear property line to the foundation plane on the home (excludes popouts for fireplaces, media niches, and/or bay windows)
(9) REDUCED SETBACK: Side setbacks are reduced to 20 ft for lots 29, 30, 34, and 35.

ACCESSORY STRUCTURES:
Accessory structures are allowed with building heights up to 25 ft.
Front yard setback: 35 ft
Side and Rear setback: 10 ft

Source: Ruggeri-Jensen-Azar, February 2018.

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Exhibit 2-4
Project Site Plan

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Source: Ripley Design Group Landscape Architecture Land Planning, February 2018.

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Exhibit 2-5
Project Site Landscaping Plan

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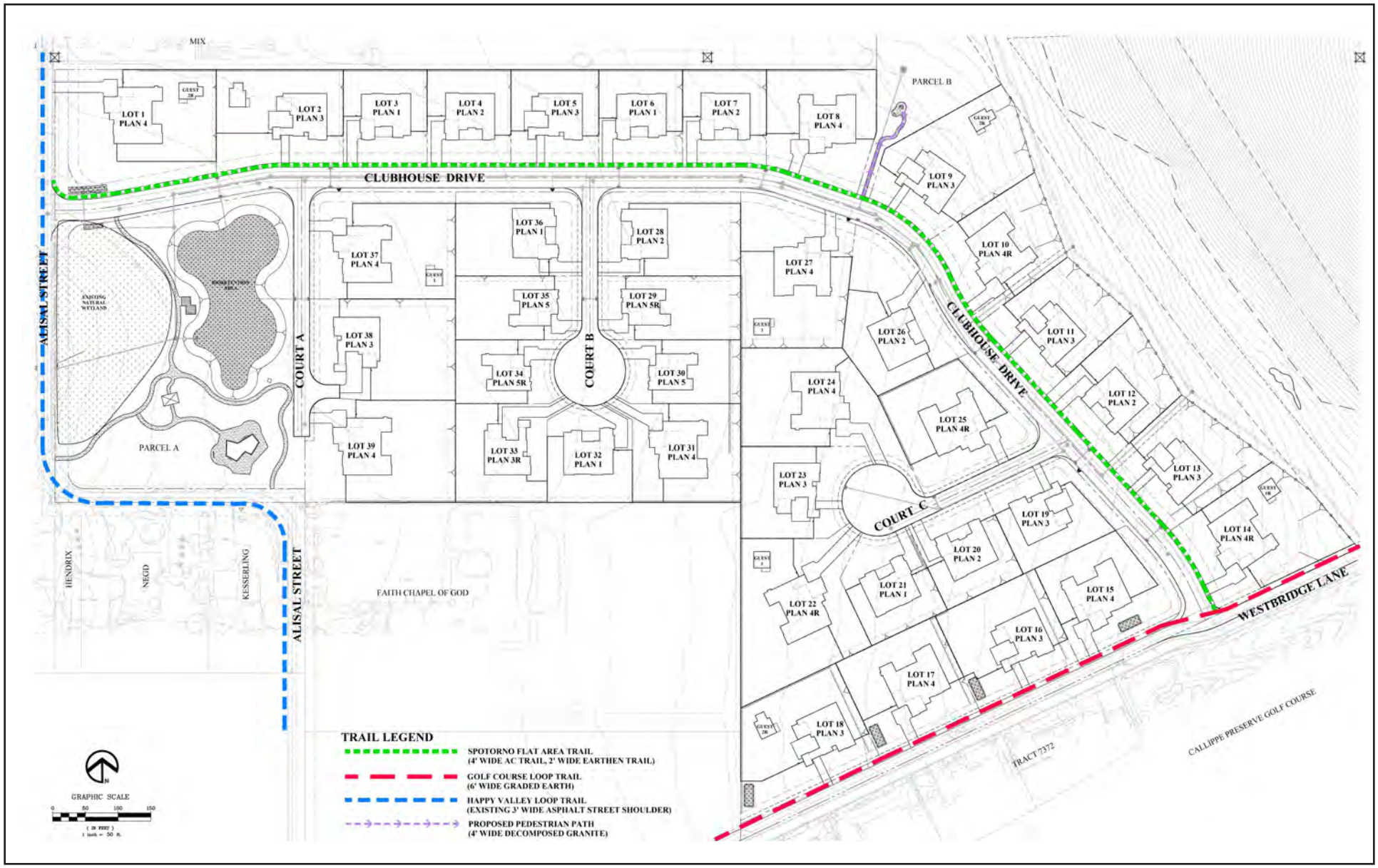


Source: Ripley Design Group Landscape Architecture Land Planning, February 2018.

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Exhibit 2-6a
Project Trails Map

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**Legend**

- Lund Ranch Trail (paved, 10 ft.+ wide)
- Callippe Trail (natural, 6 ft. wide min)
- Spotorno Connector Trail (natural, 6 ft wide)
- Spotorno Flats Trail (paved, 10 ft + wide)
- Alisal Trail (paved, 6 ft. min.)
- Westbridge Connector Trail (paved, 6 ft. min.)
- Spotorno Hills Trails (natural, 6 ft. wide min)

Source: April 2018 Public Review Draft Pleasanton Trails Master Plan, City of Pleasanton 2018.

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Exhibit 2-6b
Future Trail System Detail Map

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Currently there are two pedestrian facilities adjacent to the site: the Happy Valley Loop Trail and Golf Course Loop Trail. The Happy Valley Specific Plan identifies the Spotorno Flat Area Trail (number 4 on the HVSP Trails Plan exhibit) within the Spotorno property area. In addition, the HVSP identifies two other trails within the Spotorno property area: the "Bypass Road Trail" (number 3 on the HVSP Trails Plan exhibit), and the "Spotorno MDR/Foley Ranch Trail connection" (number 7A on the exhibit), which would connect from the Bypass Road Trail, to the east. The 1993 Trails Master Plan shows trails along Westbridge Lane, and connecting from Minnie Street (approximately) across the north edge of the Specific Plan area to the east. The 1993 Master Plan shows a range of facility types and designs, ranging from "Class A" regional trails, "Class B" trails that are separated from streets, and "Class C" trails, which are local/connector trails that are typically on-street, with widths ranging from 4 to 8 feet, depending on location and use.

The City is currently undertaking an update to the Trails Master Plan, with adoption expected in late 2018. The April 2018 Public Review Draft of the updated Master Plan further defines these trails to include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect Spotorno Flat Area Trail to the Foley property to the east, and Lund Ranch (Exhibit 2-6b). Note that, although the updated Trails Master Plan Update is not yet adopted, it likely will be adopted before the Spotorno Ranch Project is considered for approval by the City and therefore it has been determined appropriate to consider the project for conformance with this document. As discussed in greater detail in Section 3.12 Transportation, the project would incorporate a planned trail network consistent with the intent of the network shown in the Draft Trails Master Plan and Happy Valley Specific Plan that would be approved by the City prior to the issuance of building permits.

### 2.4.5 - Grading

The project would have an even cut and fill ratio. Approximately 42,800 cubic yards (cy) of material would be generated from grading activities to construct the home sites, streets/sidewalk, and bio-retention, and also from utility and lot spoil piles (waste material from related excavation). Approximately 38,400 cy of this material would be used as fill for the home sites; the remaining fill material (approximately 2,400 cy) would be placed on Parcels A, B, and on-site roads and the balance would compensate for the assumed 5 percent shrinkage. An estimated 31,000 cubic yards of cut and an equal amount of fill would be required for the landslide repair work. The excavated material would be re-used as engineered fill, and then the original grades would be restored. As a result, the site grading would be balanced for grading required for landslide repair work, and neither off-haul nor import of dirt would be required.

### 2.4.6. Utilities

The project site does not include any existing utility systems. Water, wastewater, and stormwater infrastructure systems are located immediately adjacent to the project site, within Alisal Street and Westbridge Lane. Exhibit 2-7 shows the proposed project's stormwater infrastructure; Exhibit 2-8 shows the proposed project's grading and utility plan.

The project would include a 12-inch-diameter water pipeline extending along Clubhouse Drive, and 8-inch water mains in the internal courts, providing connections to each home site. The water supply system would connect to an existing 12-inch water line that is located within Alisal Street and Westbridge Lane adjacent to the project site. The water system is owned and maintained by the City of Pleasanton.

An 8-inch sewer main would be routed within the project roadway, providing connections to each home site. The sewer system would connect to the existing 8-inch sewer line located within Alisal Street, immediately west of the project site. The sewer line is owned and maintained by the City of Pleasanton.

Two separate storm drain systems would be constructed within the project, ranging in diameter from 15 to 36 inches. The storm drain system would collect runoff from lots and streets and discharge directly to the pond on Parcel A for stormwater treatment and flood mitigation. The second system (bypass system) would collect runoff from the upland area and subdivision areas that have already been treated. These two systems would converge downstream of the Parcel A pond and connect to the existing 36-inch culvert under Alisal Street. Runoff in the bypass system would be diverted into the pond under high flow situation to mitigate for increased site runoff.

Stormwater on Lots 15–18 would be treated by on-lot bio-retention and discharge directly to Westbridge Lane via thru-curb drains, or similar conveyance.

Pacific Gas and Electric Company (PG&E) would supply gas and electrical services to and within the project site. Electrical service is generally provided by way of a 12-kilovolt, three-phase overhead line system located along the Happy Valley loop roads.[6] Further expansion of this system would be the responsibility of PG&E, with the costs shared by PG&E and the project developer. These systems would be installed underground.

Telephone service is provided to the project site by Pacific Bell Telephone Company. Cable is provided by TCI. Both services would be required to expand into the project site, costs to be shared by the providers and the project developer.[7]

## 2.4.6 - Visual Characteristics

New residences contemplated as a part of the project were designed, according to the applicant, with the intent of maintaining the rural character that defines the HVSP (see discussion under Section 2.2.3, above). There would be relatively large spacing between each home (40 to 50 feet), and home designs would reflect five architectural styles, as shown on Exhibit 2-9, Exhibit 2-10, Exhibit 2-11, and Exhibit 2-12 intended to draw from rural country architectural styles of American, Spanish, Italian, and French origin as well California modern. The homes would be a combination of single story, two-story and partial second story designs; some home plans would have the option for an attached guest unit addition. The homes would range between approximately 3,000 and 4,400

[6] City of Pleasanton. 1998. HVSP. Page 77.
[7] City of Pleasanton. 1998. HVSP. Page 78.

square feet. Fences would be no greater than 6 feet in height, and would be constructed in a style that complements the project's semi-rural setting.

## 2.4.7 - Land Use Approvals

The project requires a number of approvals, including approval of General Plan and Specific Plan amendments, and rezoning of the property and approval of a Planned Unit Development (PUD) Plan. These approvals would be necessary to allow for the project's proposed land use scheme and circulation plan to be in conformance with these regulatory documents, and are also intended to reflect and bring them into conformance with Measures PP and QQ. As described above, clarification of the UGB, proposed to be processed as a minor UGB refinement, is also included among the project approvals. These approvals are outlined in more detail below:

### General Plan Amendments

1. Modify the General Plan land use diagram for an approximately 11-acre area in the east portion of Spotorno Flat Area from Open Space—Public Health and Safety to Low Density Residential with a density of 1.25 units/acre (Exhibit 2-13). This modification is needed to align the boundaries of the land use district with the refined UGB line;
2. Modify the General Plan land use diagram for an approximately 15 acre area in the northeast portion of the Spotorno Upper Valley Area from Medium Density Residential to Open Space—Agriculture and Grazing (Exhibit 2-13);
3. Change the maximum density allowed for the Spotorno Flat Area from one unit per 1½ gross acres (equivalent to 0.67 unit/acre) when developed in conjunction with major open-space land or agricultural/open space easement dedication; to 1.25 units/acre when developed in conjunction with major open-space land or agricultural/open space dedication;
4. Refine the location of the Urban Growth Boundary (UGB) based on the 1996 voter-approved Measure FF to align with the base of Spotorno Hill consistent with the text of Measure FF. This change would also be formalized through a minor UGB refinement as shown in Exhibit 2-2; and
5. Eliminate the Bypass Road from the General Plan Circulation Element.

### HVSP Amendments to:

1. Change the Planned Unit Development—Medium Density Residential (PUD-MDR) land use/zoning designation in the Spotorno Upper Valley Area (Lot 97 and a small portion of Lot 98) to Planned Unit Development—Ag Open Space (PUD-A/OS) (Exhibit 2-14 and Exhibit 2-15);
2. Change the Planned Unit Development—Semi-Rural Density Residential (PUD-SRDR) land use/zoning designation in the Spotorno Flat Area to Planned Unit Development—Low Density Residential (PUD-LDR) (Exhibit 2-14 and Exhibit 2-15);
3. Change the maximum potential new residential units in the Spotorno Flat Area from 22 units to 39 units with major open space dedication; and
4. Eliminate the Bypass Road and modify associated trail alignments.

**Planned Unit Development (PUD) Rezoning and Development Plan to:**

1. Rezone approximately 33 acres of Lot 98 in the Spotorno Flat Area from PUD-SRDR to PUD-LDR;
2. Rezone approximately 15 acres, which includes Lot 97 and a portion of Lot 98, in the Spotorno Upper Valley from PUD-MDR to PUD-A/OS;
3. Dedicate approximately 80 acres of the project site to open space easements, or other instruments to permanently preserve as agriculture/open space; and
4. Construct 39 homes and related improvements.

The project would also require the adoption of a development plan, and subdivision maps in compliance with the Subdivision Map Act.

## 2.5 - Project Buildout

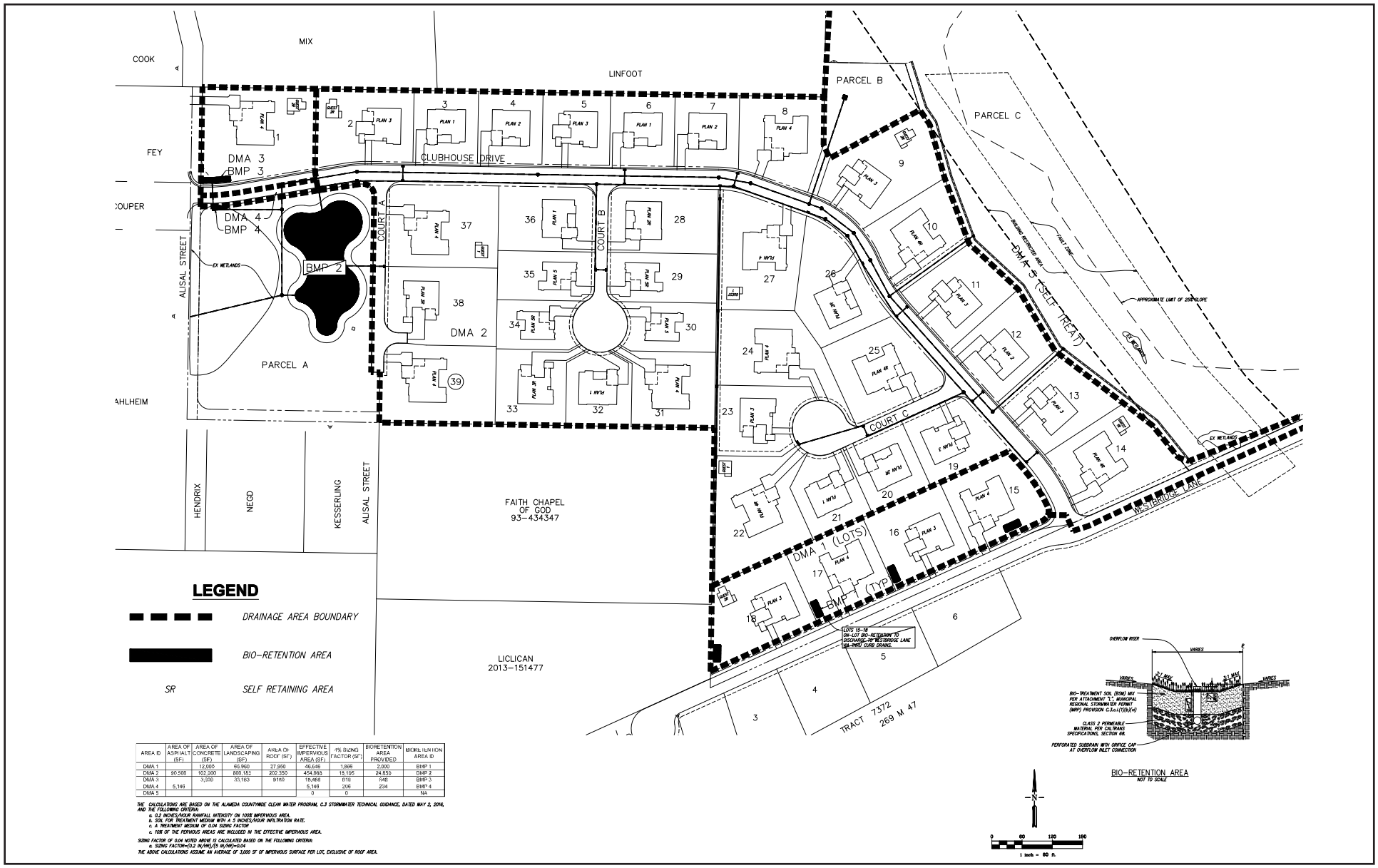
Table 2-2 summarizes the proposed buildout of the Specific Plan, inclusive of the amendments proposed to the HVSP.

**Table 2-2: Developable Units**

| Specific Plan Subarea | Existing Happy Valley Specific Plan | | With Proposed HVSP Amendments | Difference |
|---|---|---|---|---|
| | Developable Acreage | Allowable Maximum Units | | |
| Spotorno Upper Valley Area (MDR) | 15 | 75 | 0 | -75 |
| Spotorno Upper Valley Area (LDR)[2] | 5 | 5 | 5 | 0 |
| Greater Happy Valley Subarea—Spotorno Flat Area | 33 | 22[1] | 39 | +17 |
| Greater Happy Valley Subarea—Remainder[2] | 246 | 47[1] | 47 | 0 |
| Other HVSP Subareas[2] | 566 | 34 | 34 | 0 |
| **Total** | — | 183 | 125 | -58 |

Notes:
[1] HVSP Table V-1 does not apportion the total 69 units identified for the entire 279-acre Greater Happy Valley Subarea between Spotorno Flat Area and the remainder of the Subarea; however, to illustrate the buildout with the proposed Specific Plan amendment, development of Spotorno Flat Area is assumed at maximum allowable for PUD-SRDR district (1 unit per 1.5 acres, or 22 units) under the existing Specific Plan, with the remaining 47 units assumed to develop elsewhere in the subarea.
[2] Not proposed to be amended

With the amendments, the MDR portion of the Spotorno Upper Valley Area would be designated Agricultural Open Space, allowing no residential units to be constructed. The Spotorno Flat Area would have a density of 1.25 units per acre, allowing for a maximum of 39 units. The net change to buildout would be 58 fewer units than contemplated for the two areas in the HVSP.




| AREA ID | AREA OF ASPHALT (SF) | AREA OF CONCRETE (SF) | AREA OF LANDSCAPING (SF) | AREA OF ROOF (SF) | EFFECTIVE IMPERVIOUS AREA (SF) | 1% SIZING FACTOR (SF) | BIORETENTION AREA PROVIDED | BIORETENTION AREA ID |
|---|---|---|---|---|---|---|---|---|
| DMA 1 | | 12,000 | 69,960 | 27,950 | 46,646 | 1,866 | 2,000 | BMP 1 |
| DMA 2 | 90,500 | 102,000 | 800,182 | 202,350 | 454,868 | 18,195 | 24,850 | BMP 2 |
| DMA 3 | | 3,030 | 33,163 | 9160 | 15,468 | 619 | 648 | BMP 3 |
| DMA 4 | 5,146 | | | | 5,146 | 206 | 234 | BMP 4 |
| DMA 5 | | | | | 0 | 0 | | NA |

THE CALCULATIONS ARE BASED ON THE ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM, C.3 STORMWATER TECHNICAL GUIDANCE, DATED MAY 2, 2016, AND THE FOLLOWING CRITERIA:

a. 0.2 INCHES/HOUR RAINFALL INTENSITY ON 100% IMPERVIOUS AREA.
b. SOIL FOR TREATMENT MEDIUM WITH A 5 INCHES/HOUR INFILTRATION RATE.
c. A TREATMENT MEDIUM OF 0.04 SIZING FACTOR
c. 10% OF THE PERVIOUS AREAS ARE INCLUDED IN THE EFFECTIVE IMPERVIOUS AREA.

SIZING FACTOR OF 0.04 NOTED ABOVE IS CALCULATED BASED ON THE FOLLOWING CRITERIA:

a. SIZING FACTOR=(0.2 IN/HR)/(5 IN/HR)=0.04

THE ABOVE CALCULATIONS ASSUME AN AVERAGE OF 3,000 SF OF IMPERVIOUS SURFACE PER LOT, EXCLUSIVE OF ROOF AREA.

Source: Ruggeri-Jensen-Azar Engineers/Planners/Surveyors, February 2018.

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Exhibit 2-7
Preliminary Stormwater Treatment Plan

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**ESTIMATED EARTHWORK QUANTITIES**

| ITEMS | CUT (C.Y.) | FILL (C.Y.) |
|---|---|---|
| LOTS | 14,200 | 38,400 |
| PARCEL A & B | 14,200 | 1,400 |
| STREETS/TRAIL | 5,400 | 1,000 |
| UTILITY SPOIL | 5,000 | 0 |
| LOT SPOIL (100 CY A/OT) | 4,000 | 0 |
| SHRINKAGE (10% ON FILL) | 0 | 2,000 |
| LANDSLIDE REPAIR | 31,000 | 31,000 |
| TOTAL | 73,800 | 73,800 |

1. ALL QUANTITIES SHOWN ON THIS PLAN ARE APPROXIMATE, CALCULATED CUT AND FILL ARE TO "ROUGH GRADE" AND EXISTING GROUND. THE ACTUAL AMOUNT OF EARTH MOVED IS VARIABLE DEPENDENT ON COMPACTION, CONSOLIDATION, STRIPPING REQUIREMENTS, AND THE CONTRACTOR'S METHOD OF OPERATION.

Source: Ruggeri-Jensen-Azar, May 2018.

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# Exhibit 2-8
# Preliminary Grading and Utility Plan

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FRONT ELEVATION

SCALE: 1/4" = 1'-0"

REAR ELEVATION

SCALE: 1/4" = 1'-0"

Source: Woodley Architectural Group, Inc. December 2017.

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Exhibit 2-9
Conceptual Spanish Ranch Style

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FRONT ELEVATION

SCALE: 1/4" = 1'-0"

REAR ELEVATION

SCALE: 1/4" = 1'-0"

Source: Woodley Architectural Group, Inc. December 2017.

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Exhibit 2-10
Conceptual Italian Farmhouse

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Source: Woodley Architectural Group, Inc. December 2017.

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Exhibit 2-11
Conceptual French Country Style

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elevationD - MODERN FARMHOUSE

SCALE: 1/4" = 1'-0"

elevationE - CALIFORNIA MODERN

SCALE: 1/4" = 1'-0"

Source: Woodley Architectural Group, Inc. December 2017.

FIRSTCARBON SOLUTIONS™

Exhibit 2-12
Conceptual Modern Farmhouse and California Modern Style

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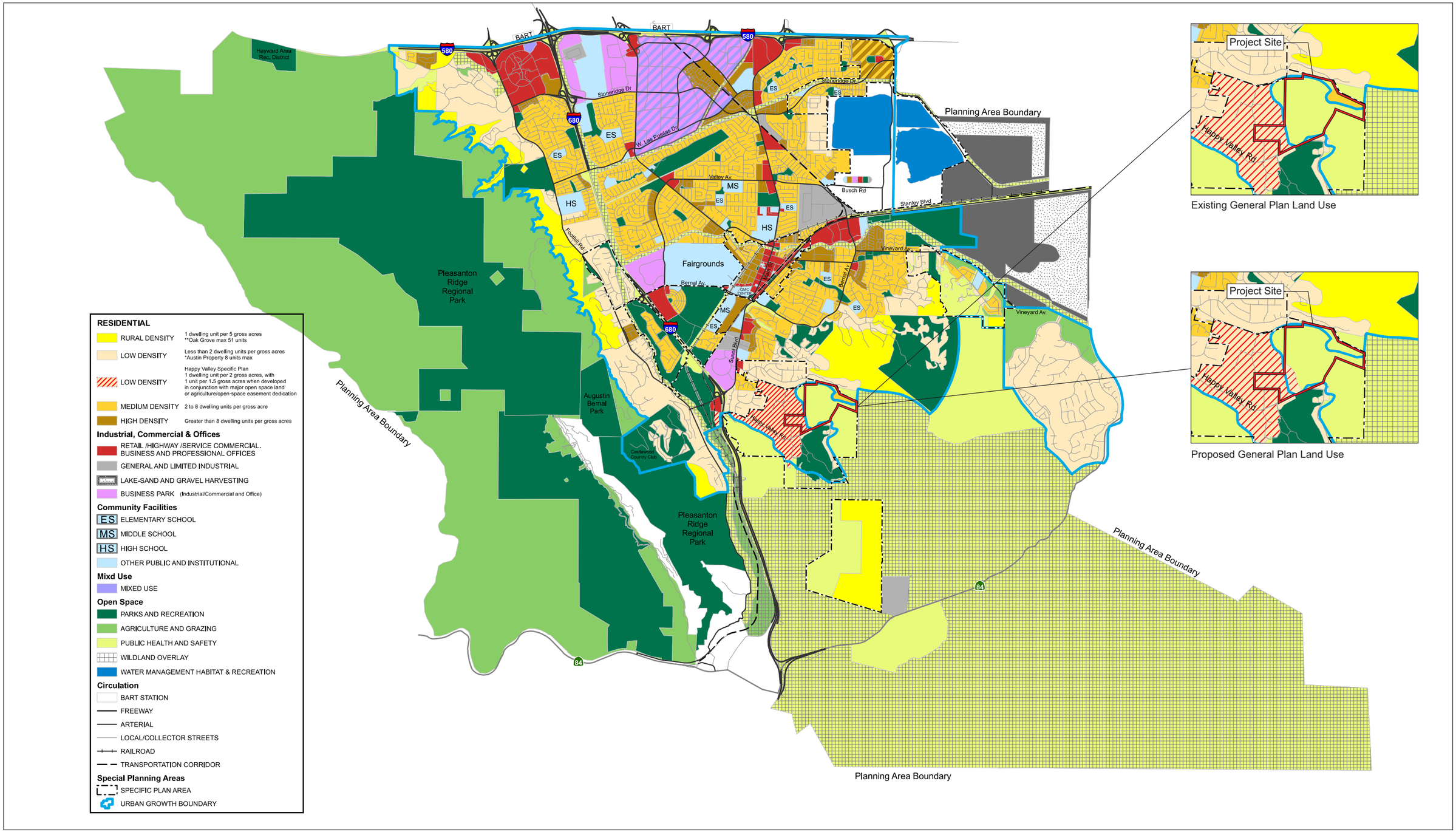


Source: City of Pleasanton General Plan Land Use Map 2005-2025 (adopted July 21, 2009).

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Exhibit 2-13
Existing and Proposed General Plan Land Use

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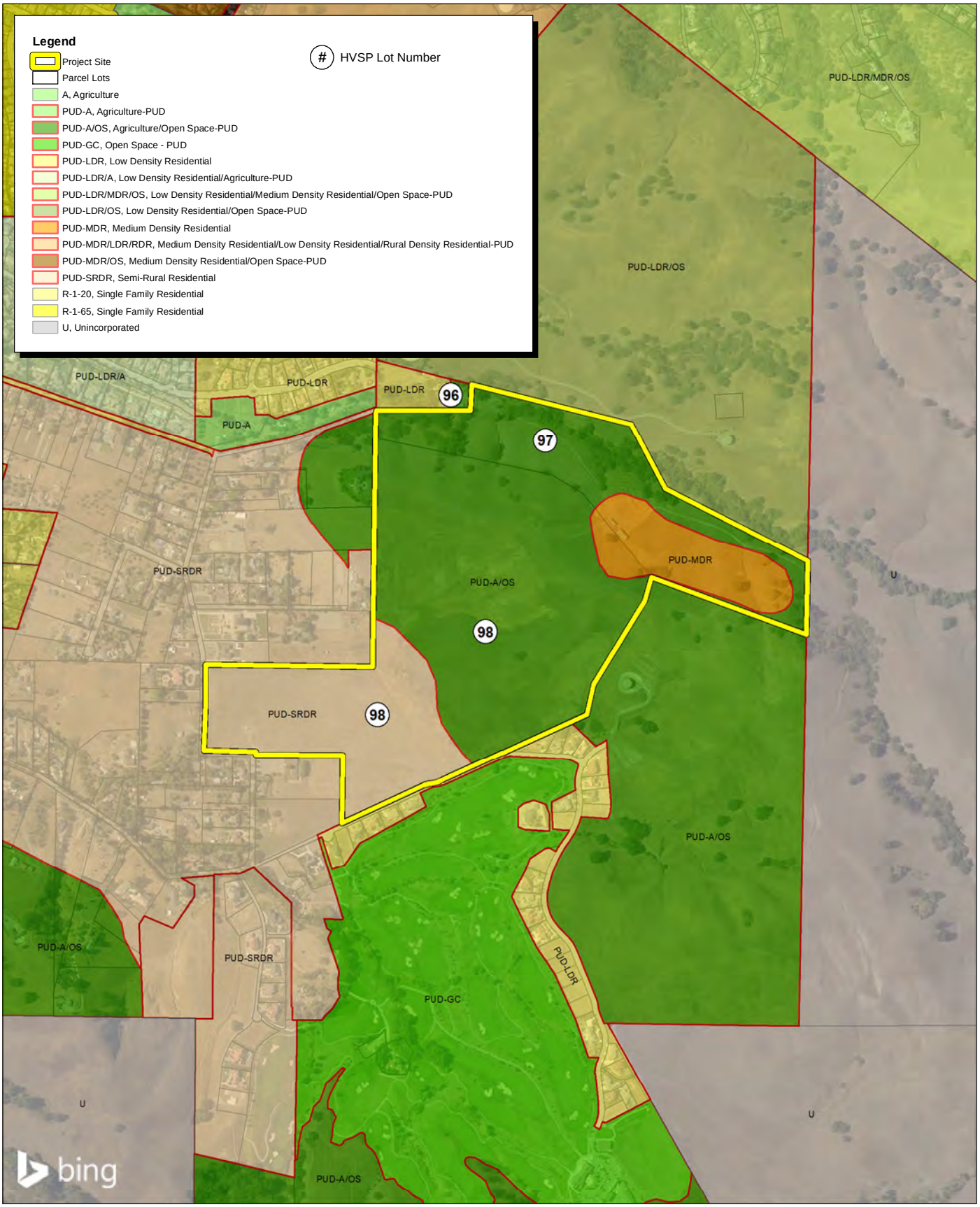


Source: bing Aerial Imagery. City of Pleasanton GIS data.

FIRSTCARBON SOLUTIONS™

1,000 500 0 1,000 Feet

# Exhibit 2-14
# Existing HVSP Land Use Designations

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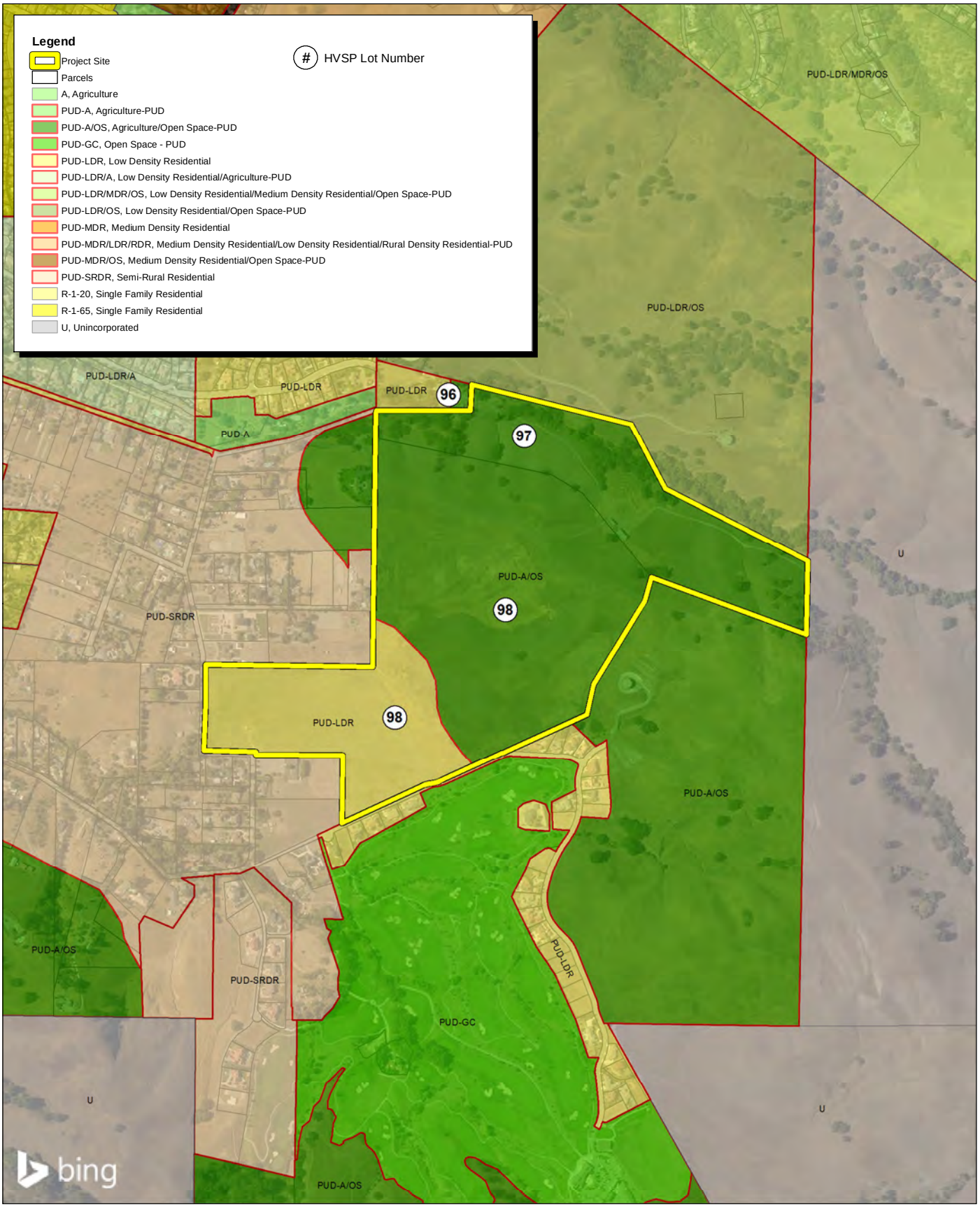


Source: bing Aerial Imagery. City of Pleasanton GIS data.

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1,000 500 0 1,000 Feet

# Exhibit 2-15
# Proposed HVSP Land Use Changes

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## 2.6 - Construction Schedule

The construction of the project is assumed to begin with site preparation in 2019, and continue for 2 years, with completion anticipated by the end of 2020.

## 2.7 - Intended Use of the SEIR

This Draft SEIR has been prepared by the City to assess the potential environmental impacts of the proposed Spotorno Project. Pursuant to CEQA Guidelines Section 15367, the City is the lead agency for preparation of the SEIR and has discretionary authority over the project and below-listed project approvals.

## 2.8 - Summary of Required Approvals

The project would require the following discretionary and ministerial approvals. Section 2.4.7, above, provides additional detail on some of the required discretionary approvals.

### 2.8.1 - Discretionary Actions

- General Plan Amendments
- Specific Plan Amendments
- Planned Unit Development Rezoning and Development Plan
- Vesting Tentative and Final Subdivision Map and Improvement Plans
- Growth Management Agreement, for 39 Growth Management Unit Allocations
- Affordable Housing Agreement (The proposed development does not include an affordable housing component; the applicant is proposing to pay Low Income In-Lieu Housing Fees)

### 2.8.2 - Ministerial Actions

Subsequent ministerial actions would be required for the implementation of the project, including, without limitation, issuance of grading permits, building permits, and certificates of occupancy.

## 2.9 - Responsible and Trustee Agencies

A number of other agencies in addition to Alameda County will serve as Responsible and Trustee Agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, respectively. This Draft SEIR will provide environmental information to these agencies and other public agencies, which may be required to grant approvals or coordinate with other agencies, as part of project implementation. These agencies may include but are not limited to the following:

- United States Fish and Wildlife Service
- United States Army Corps of Engineers
- California Department of Fish and Wildlife
- San Francisco Bay Regional Water Quality Control Board
- Alameda County Flood Control and Water Conservation District (Zone 7)
- Dublin San Ramon Services District
- Alameda County Department of Environmental Health

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# SECTION 3: ENVIRONMENTAL IMPACT ANALYSIS

## Organization of Issue Areas

This Draft Subsequent Environmental Impact Report (Draft SEIR) provides analysis of impacts for those environmental topics where it was determined in the Notice of Preparation, or through subsequent analysis that the proposed project would result in "potentially significant impacts." Sections 3.1 through 3.14 discuss the environmental impacts that may result with approval and implementation of the proposed project.

## Issues Addressed in this Subsequent EIR

The following environmental issues are addressed in Section 3:

- Aesthetics, Light, and Glare
- Air Quality
- Biological Resources
- Cultural Resources
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Public Services
- Transportation and Traffic
- Tribal Cultural Resources
- Utilities and Service Systems

## Level of Significance

Determining the severity of project impacts is fundamental to achieving the objectives of CEQA. CEQA Guidelines Section 15091 requires that decision makers mitigate, as completely as is feasible, the significant impacts identified in the Final EIR. If the EIR identifies any significant unmitigated impacts, CEQA Guidelines Section 15093 requires decision makers in approving a project to adopt a statement of overriding considerations that explains why the benefits of the project outweigh the adverse environmental consequences identified in the EIR.

The level of significance for each impact examined in this Draft SEIR was determined by considering the predicted magnitude of the impact against the applicable threshold. Thresholds were developed using criteria from the CEQA Guidelines and checklist; state, federal, and local regulatory schemes; local/regional plans and ordinances; accepted practice; consultation with recognized experts; and other professional opinions.

## Impact Analysis and Mitigation Measure Format

The format adopted in this SEIR to present the evaluation of impacts is described and illustrated below.

### Summary Heading of Impact

| | |
|---|---|
| **Impact AES-1:** | **An impact summary heading appears immediately preceding the impact description (Summary Heading of Impact in this example). The impact number identifies the section of the report (AES for Aesthetics, Light, and Glare in this example) and the sequential order of the impact (1 in this example) within that section. To the right of the impact number is the impact statement, which identifies the potential impact.** |

#### *Impact Analysis*

A narrative analysis follows the impact statement.

#### *Level of Significance Before Mitigation*

This section identifies the level of significance of the impact before any mitigation is proposed.

#### *Mitigation Measures*

In some cases, following the impact discussion, reference is made to state and federal regulations and agency policies that would fully or partially mitigate the impact. In addition, policies and programs from applicable local land use plans that partially or fully mitigate the impact may be cited.

Project-specific mitigation measures, beyond those contained in other documents, are set off with a summary heading and described using the format presented below:

**MM AES-1** Project-specific mitigation is identified that would reduce the impact to the lowest degree feasible. The mitigation number links the particular mitigation to the impact it is associated with (**AES-1** in this example); mitigation measures are numbered sequentially.

#### *Level of Significance After Mitigation*

This section identifies the resulting level of significance of the impact following mitigation.

Abbreviations used in the mitigation measure numbering are:

| Code | Environmental Issue |
|---|---|
| AES | Aesthetics, Light, and Glare |
| AIR | Air Quality |
| BIO | Biological Resources |
| CUL | Cultural Resources |

| Code | Environmental Issue |
|---|---|
| GEO | Geology, Soils, and Seismicity |
| GHG | Greenhouse Gas Emissions |
| HAZ | Hazards and Hazardous Materials |
| HYD | Hydrology and Water Quality |
| LUP | Land Use and Planning |
| NOI | Noise |
| PS | Public Services |
| TRANS | Transportation and Traffic |
| TCR | Tribal Cultural Resources |
| USS | Utilities and Service Systems |

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# 3.1 - Aesthetics, Light, and Glare

## 3.1.1 - Introduction

This section describes the existing aesthetics, light, and glare setting and potential effects from project implementation on visual resources of the site and its surroundings. Descriptions and analysis in this section are based on information contained in the City of Pleasanton General Plan, General Plan EIR, Happy Valley Specific Plan, and Happy Valley Specific Plan Final EIR.

## 3.1.2 - Environmental Setting

### Visual Character

#### *Regional Setting*

The project site is located within the greater San Francisco Bay area, in the eastern valley of Alameda County, approximately 25 miles east of Oakland in the City of Pleasanton. Residential development within the vicinity of the project site includes both older single-family residences and more recently developed subdivisions. The project is also located near the Callippe Preserve Golf Course, an approximately 185-acre recreation and open space area that includes an 18-hole golf course and clubhouse, hiking trails, natural conservation areas, and low-density residential housing.

#### *Project Site*

The project site is located in southeastern Pleasanton, within an area characterized by rural residential land uses and a flat valley floor, with steep sloping hills to the east and south. The overall project site is approximately 154-acres of open ranch land and is surrounded by Alisal Street (west), large parcel residential (north and east), and Westbridge Lane, Faith Chapel Assembly of God Church, and Alisal Street (south). The western portion of the site (approximately 31 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acres) contains hilly terrain. Within the western portion of the site is a wetland area and a windmill that powers an irrigation well. The site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel Assembly of God Church.

### Visual Distance Zones

The following distance zones (foreground, middleground, and background) can be used to characterize the dominant visual character from each vantage point and describe views in terms that can be analyzed and compared. The sensitivity of views, which may be modified by the proposed project, are defined in order to establish thresholds for the analysis of potential visual impacts resulting from the implementation of the project.

#### *Foreground Views*

These views include elements that can be seen at a close distance and dominate the entire view. Viewer groups affected by changes in views, such as surrounding residents, pedestrians, or regular motorists are most impacted by modified views at this distance.

### *Middle Ground Views*

These views include elements that can be seen at a middle distance and that partially dominate the view. A sensitive viewer group would consider these impacted views potentially adverse.

### *Background Views*

Although background views are part of the overall visual composition of the view, these views include elements that are seen at a long distance and typically do not dominate the view. A sensitive viewer group would consider these impacted views potentially adverse.

### Scenic Resources

The City of Pleasanton is located mostly within the Amador Valley, one of the three valleys constituting the Tri-Valley. The Tri-Valley, outlined by the Diablo Range of hills, is a sheltered inland valley. Hills ranging from 1,000 to 1,500 feet border the valley floor to the west (including the Pleasanton and Main Ridges) and east. The Las Trampas Ridge is also visible to the northwest. To the north lies the Black Hills, including Mount Diablo, and to the south the valley rises up to 3,500 feet. These surrounding scenic resources define the high points of the Tri-Valley area and provide a scenic backdrop for all development in the valley floor portions of the Planning Area. Agricultural land uses that primarily consist of grazing lands along with some vineyards are located in the western and southern hills next to the City.

## 3.1.3 - Regulatory Framework

### State

### *Title 24 of the California Code of Regulations Building Energy Efficiency Standards*

California Building Code (California Code of Regulations [CCR], Title 24)—including Title 24, Part 6—includes Section 132 of the Building Energy Efficiency Standards, which regulates lighting characteristics, such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off. Different lighting standards are set by classifying areas by lighting zone (LZ). The classification is based on population figures of the 2000 Census. Areas can be designated as LZ1 (dark), LZ2 (rural), or LZ3 (urban). Lighting requirements for dark and rural areas are stricter in order to protect the areas from new sources of light pollution and light trespass.

### *California Scenic Highway Program*

Interstate 680 (I-680) is a designated scenic highway, from the Contra Costa County line southward to Mission Boulevard; this includes the section of I-680 that passes by the project area. The State Legislature created the California Scenic Highway Program, maintained by the California Department of Transportation (Caltrans), in 1963. The purpose of the State Scenic Highway Program is to protect and enhance the natural scenic beauty of California highways and adjacent corridors, through special conservation treatment. The State laws governing the Scenic Highway Program are found in the Streets and Highways Code, Sections 260 through 263. A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The State Scenic Highway System includes a list of highways that are either eligible for designation as scenic highways or have been officially designated. The status of a proposed state

scenic highway changes from eligible to officially designated when the local governing body applies to Caltrans for scenic highway approval, adopts a Corridor Protection Program, and receives notification that the highway has been officially designated a Scenic Highway.

## Local

### *City of Pleasanton General Plan*

The City of Pleasanton General Plan establishes the following goals, policies, and programs related to aesthetics, light, and glare that are applicable to the project:

**Land Use Element**

- **Policy 21:** Preserve scenic hillside and ridge views of the Pleasanton ridgelands and Southeast Hills.
- **Policy 8:** Preserve as permanent open space all areas of outstanding scenic qualities or areas which provide extraordinary views of natural and human-made objects.
  - **Program 8.5:** Encourage developers to work with entities such as the Tri-Valley Conservancy to dedicate scenic/conservation easements for private open-space areas possessing exceptional natural, scenic, and/or vegetation or wildlife habitat qualities.
  - **Program 8.6:** Encourage developers to provide open-space buffers in areas where there are conflicting land uses.

**Community Character Element**

- **Goal 7:** Preserve the open space character at the edges of the City.
- **Policy 19:** Require that design of new residential development in hillside areas complement the natural appearance of the open space.
- **Policy 20:** Preserve scenic hillside and ridge views, and other natural features in the hills.
  - **Program 20.2:** In new developments, preserve scenic hillsides and other hillside features including ridges, plants, streams, and wildlife.
  - **Program 20.3:** Discourage grading on slopes of 25 percent or greater.

### *Happy Valley Specific Plan*

The Happy Valley Specific Plan establishes the following goals and objectives related to aesthetics, light, and glare that are applicable to the project.

**A. Overall Goals**

- **Goal 2:** To preserve the existing semi-rural character of the Neighborhood.

**B. Development Standards and Design Guidelines**

*PUD-Semi-Rural Density Residential District (Greater Happy Valley)*

- **Objective a:** Maintain the area's existing semi-rural character.
- **Objective b:** Maintain the open-space feeling between adjacent homes and other structures.
- **Objective c:** Minimize the visual prominence of homes.
- **Objective d:** Encourage diversity in landscape design.

*PUD-Agriculture/Open Space*

- **Objective a:** Maintain the visually open character of the area.
- **Objective b:** Maintain the agricultural character of the area.

**D. Neighborhood Character Objectives**

- **Objective 1:** to maintain the existing semi-rural character of the Plan Area in terms of architecture, road design, landscaping, etc.
- **Objective 2:** To preserve existing views of the surrounding hillside areas from the Valley
- **Objective 5:** To preserve the clear night view of the sky without interference from ground lighting sources, consistent with providing public safety.

### *Pleasanton Municipal Code*

Chapter 18.20 of the Pleasanton Municipal Code sets forth requirements related to design review, including types of projects that are subject to review, the scope of review, and the procedures by which review occurs. Chapter 18.28 prevents a process or use of equipment or materials that produce illumination or glare, which is found to be objectionable to persons residing or working in the vicinity.[1]

## 3.1.4 - Methodology

FCS reviewed the City of Pleasanton General Plan and Happy Valley Specific Plan to identify relevant goals and policies related to aesthetics, light, and glare that are applicable to the proposed project. FCS reviewed project site plans and coordinated with the City of Pleasanton staff to identify representative view corridors/view points on the project site. FCS staff prepared "before" and "after" visual simulations of the proposed project as viewed from the selected view points on Westbridge Lane, Happy Valley Road, Alisal Street, and Laura Lane. "Before" images consist of photographs of the project site depicting existing conditions. "After" images consist of computer-generated images that incorporate proposed site and architectural plans for the proposed project.

## 3.1.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist of the CEQA Guidelines, aesthetics impacts resulting from the implementation of the proposed project would be considered significant if the project would:

a) Have a substantial adverse effect on a scenic vista

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

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

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

[1] City of Pleasanton General Plan DEIR, Visual Resources, 3.11-4, September 2008

## Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to visual resources. The HVSP FEIR found that the project would result in less than significant impacts in relation to visual resources with adherence to development standards and design guidelines as outlined in Table 3.1-1.

### Table 3.1-1: Visual Resources Site Development Standards and Design Guidelines

| Land Use[1] | Specific Visual Resource Protections |
|---|---|
| 2-3. PUD-Low Density Residential District (Spotorno Upper Valley and Golf Course Properties Housing Areas) | • Site development standards in the Specific Plan establish protection for view corridors from the southern Alisal Street area.<br>• Design guidelines require design of Golf Course homes to enhance the view of the Golf Course area from Bypass Road **[this protection is not applicable to this project].** |
| 4. PUD—Semi-Rural Density Residential District (Greater Happy Valley) | • Site development standards in the Specific Plan include the following:<br>–Establish protection for view corridors from the vicinity of Alisal Street, applicable to Lots 98, 99, and 100 and other lots near Lot 98. Suggested strategies include requiring larger minimum setbacks, placing larger lots near Alisal Street, while encouraging" smaller lots not less than one acre in size" at the eastern end of the PUD-SRDR potion of Lot 98.<br>–Limiting floor area ratio, and requiring a minimum number of homes on Lot 98 to be single story.<br>• Design guidelines include the objective of minimizing the visual prominence of homes; requiring grading to respect natural landforms, clustering home sites on one-acre minimum size lots to preserve open space and view corridors, promoting a diversity of semi-rural architecture, and incorporating generous landscaping along roadways and between buildings and "informal" landscape plantings. |
| 6. PUD—Open Space | • Design guidelines specify that new structures should be sited to minimize their visibility from the vicinity of the Happy Valley Loop roads and that grading for development of hilly areas should respect natural landforms. |

Notes:
[1] Protections for PUD-Medium Density Residential District (Spotorno Upper Valley) and PUD-Golf Course were not included because they are not applicable to this project.
Source: MMRP for the Happy Valley Specific Plan, 1998.

These development standards would also be applicable to the Spotorno Ranch Project. In addition, the project would include a Homeowner Association-maintained open space and bioretention treatment area, which would provide protection for view corridors from the southern Alisal Street area.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the visual impacts of the project as a whole. In addition, no Bypass Road would be constructed as part of the project, which would reduce the amount of light and glare associated with the project. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to visual resources. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures where needed.

## 3.1.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

### Scenic Vistas

**Impact AES-1: The project would not have a substantial adverse effect on a scenic vista.**

#### *Impact Analysis*

Thirty-nine single-family residential lots and roadways on the approximately 31-acre Spotorno Flat Area portion of the site would be developed on flat terrain in the western portion of the site in the vicinity of existing residential development. The eastern, hilly portion of the site would remain as agricultural open space. Residential lots would range in size from approximately 22,000 square feet (0.51 acre) to approximately 38,000 square feet (0.88 acre). Homes would be constructed in a variety of architectural styles intended to draw from rural country architectural styles of American, Spanish, Italian, and French origin as well California modern.

A scenic vista is generally considered a view of an area that has remarkable scenery or a resource that is indigenous to the area. The Pleasanton General Plan recognizes arroyos, ridge views, hillsides woodlands, valleys, grazing lands, major city entryways, and open space areas as scenic resources. Scenic resources visible from the project site include hillsides, ridgelines, and open spaces. To the north, scenic resources include background views of the Blackhawk Hills, part of the Diablo Range, and Mount Diablo. To the east, scenic resources include open spaces. To the west, scenic resources include background views of wooded hillsides and ridgelines. These scenic resources are primarily part of background views seen at a distance. The HVSP also emphasizes the importance of views from southern Alisal Street toward the Golf Course.

Development and land use activities may result in buildings and structures that could interrupt scenic vistas from within and adjacent to the project site. However, such interruptions would be intermittent and the majority of the site, the visible hillside portions, would be maintained as open space. Development and land use activities would be required to adhere to the HVSP design guidelines, including an overall building height limitation of two stories, ensuring that buildings are consistent with the existing semi-rural character of the Happy Valley area, and minimizing the interruption of background views of scenic resources. Design features for development of all uses would complement the adjacent properties and draw on their surroundings to ensure compatibility. Special emphasis would be placed on site plans; setbacks; building height, massing and scale; landscape treatments;

architectural design; and color palettes to ensure compatibility, and the City could require adjustments in any of these areas to ensure consistency with the applicable design guidelines and standards. Furthermore, the substantial portions of the site that would be maintained as agricultural open space would continue to provide visual corridors to surrounding scenic vistas. With respect to views along Alisal Street, the project would maintain much of the frontage as HOA owned open space, incorporating a landscaped bioretention and wetland preservation area. The residences to the north of the bioretention area and immediately to the east would be sited on larger lots, providing for view corridors that would generally be consistent with the HVSP Guidelines for Lot 98, which directs that clustering should occur on smaller lots to the east and north of Clubhouse Drive. As such, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Scenic Resources

| | |
|---|---|
| **Impact AES-2:** | **The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic building within a state scenic highway.** |

### *Impact Analysis*

The project site consists of mostly undeveloped land, enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel Assembly of God Church. Cattle are grazed on the hilly portion of the site. There are no historic structures present on the project site.

I-680, traversing Pleasanton in a north-south direction, is an officially designated State Scenic Highway. I-580 and State Route 84, extending west of I-680, are both Eligible State Scenic Highways but are not officially designated. These three highways feature wooded hillsides and valleys and other open space. The project site is 0.73 miles west of I-680; however, because of the hilly terrain and intervening vegetation, the residential portion of the project is not visible.

The hills surrounding Happy Valley, which include the undeveloped hillsides east of the project site are identified in the Happy Valley Specific Plan as providing a scenic resource for “Valley” residents and the greater community. Approximately 80 acres of this area would be preserved as open space, as described in the Project Description, and these undeveloped hillsides would maintain their scenic contribution to this scenic corridor. Therefore, the project would not substantially damage scenic resources, including but not limited to trees, rock outcropping, and historic buildings within a state scenic highway. Therefore, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Visual Character

**Impact AES-3: The project would not substantially degrade the existing visual character or quality of the site and its surroundings.**

### *Impact Analysis*

The design guidelines applicable to the project site, as enumerated in the HVSP, are intended to maintain a positive visual character for new development. Adherence to the design guidelines as set forth in the HVSP would ensure the new development would blend in with the surrounding areas and maintain a low visual profile relative to the surrounding hills. Although new buildings would be noticeable from areas that surround the project site, the proposed new buildings would be consistent with the character of the site and existing development in the surrounding areas. The following paragraphs describe the project's impacts in relation to surrounding character and specific views of the project site from publicly accessible roads.

The proposed project would develop approximately 31 acres on the Spotorno Flat Area portion of the project site. The land surrounding the project site consists of rural residential development to the west, southwest, and north; open space to the northeast, and east; and a golf course to the south along with residential properties surrounding the golf course. The homes surrounding the project site are large-lot single-family homes with mature landscaping, large trees, and some agricultural uses such as horse stables. The project proposes several types of architectural styles consistent with the HVSP; the heights of the single-family homes would vary from 18 feet to 29 feet, as can be seen in Exhibits 2-9 through 2-12. The project would incorporate landscaping that would be consistent with the existing neighborhood and streetscape of the project area as can be seen in Exhibit 2-5.

FCS staff produced visual simulations to show the project's visual impacts at full buildout compared to the existing conditions. The visual simulations show views of the project site from several viewpoints around the project area to demonstrate the project's potential impacts to foreground, middle ground, and background views. The City of Pleasanton Planning Department staff selected the viewpoints as representative of the possible views that could be affected by the project. Exhibit 3.1-1 shows the keymap for where the viewpoints were taken and the direction they are looking.

As can be seen in the visual simulations, the proposed project would retain all background views of hillsides and mountains while also fulfilling General Plan and HVSP goals and policies. Exhibit 3.1-2 shows an existing view of the site from Westbridge Lane looking west. Exhibit 3.1-3 shows a visual simulation with the proposed project at full buildout. The visual simulation shows that foreground and

background views would not be impacted by the project. Middleground views of the site would be changed by project development, which would introduce buildings and rooftops rather than the existing open field or pasture. However, from this view the proposed project's single-family homes would resemble the neighboring single-family homes, thus blending in with the overall visual character of the project area. Although middleground views would be modified, the project would comply with HVSP goals and policies and design guidelines, to retain views of background hillsides and mountains.

Exhibit 3.1-4 shows an existing view of the project site from Happy Valley Road looking northeast. Exhibit 3.1-5 shows a visual simulation of the proposed project at buildout. The visual simulation shows that foreground and middleground views of the project from Westbridge Lane would not be impacted by the project and background views of mountains and hillsides as well as neighboring residential units would be retained. In addition, existing vegetation along Happy Valley Road would partially screen the proposed homes. From this view the proposed project would have little impact on the visual character of the project area and would comply with HVSP goals and policies.

Exhibit 3.1-6 shows the existing views looking east from Alisal Street adjacent to the proposed project site. Exhibit 3.1-7 shows the visual simulation of the proposed project at buildout. The visual simulation shows that the proposed project would alter foreground and middleground views along Alisal Street looking east but would not modify background views of the hillsides. Foreground and middleground views would be altered, including the introduction of built elements along at least some of the Alisal Street frontage. However, the project would comply with HVSP goals and policies to retain views of background hillsides and mountains, and would be required to include an appropriate site plan, setbacks, landscaping and fencing design to meet the intent of the Specific Plan with respect to views of the Golf Course from southern Alisal Street, through the PUD review and approval process.

Exhibit 3.1-8 shows existing views looking southeast from Alisal Street. The existing foreground and middle ground views are characterized by vineyards from neighboring homes and single-family homes. Background views are composed of hillsides on the project site. Exhibit 3.1-9 shows the visual simulation of the proposed project at buildout. From this view, the visual simulation shows that foreground views would not be impacted because existing development and vineyards would screen project development from view. Middleground views would be retained and the project would be barely visible from this view point. In addition, background views of the hillsides would be retained and visual character would not be impacted at this view point. Therefore, the project would comply with HVSP goals and policies to retain views of background hillsides and mountains. As noted in the discussion of Exhibit 3.1.7, above, the project would introduce built elements along at least some of the Alisal Street frontage that could alter views along southern Alisal Street; however, the project would be required to include an appropriate site plan, setbacks, landscaping and fencing design to meet the intent of the Specific Plan through the PUD review and approval process.

Exhibit 3.1-10 shows existing views looking southeast from Laura Lane. Exhibit 3.1-11 shows a visual simulation of the project at buildout. Foreground and middleground views are characterized by views of the single-family home on Laura Lane and of the on the project site. Background views are composed of the hillsides on the project site and mountains to the south. The simulation shows that the project would retain all views of surrounding hillsides and have very little visual impact on foreground and middleground views due to the low roofline of the proposed homes. Therefore, the project would comply with HVSP goals and policies to retain views of background hillsides and mountains.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Light and Glare

**Impact AES-4: The project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.**

### *Impact Analysis*

Examples of light and glare include streetlights, freestanding lights, building-mounted lights, reflective building materials, and vehicular headlights. Currently, developed portions of the surrounding area contain numerous existing sources of light and glare, including street lamps and exterior residential lights.

Build out of the proposed project would include residential land uses with new streets and pathways. New light sources would include exterior lighting associated with residential properties and illumination of walkways, streets, and patios, although the project would not include the construction of the Bypass Road, as originally envisioned in the HVSP. The proposed project may create a substantial source of nighttime light, which may affect nighttime views in the surrounding area, especially where homes would be adjacent to existing development.

The Happy Valley Specific Plan includes land use standards and design guidelines that would help minimize potential impacts of light and glare through the angling and shielding of exterior light sources downward and placement of landscaping to shield light and glare from surrounding areas. Section 18.20.030 of the Pleasanton Municipal Code states that Design Review includes the "relationship of exterior lighting to its surroundings and to the building and adjoining landscape." As such, lighting and glare would be addressed as part of the Design Review process for each project within the Specific Plan boundaries.

Additionally, construction of the project would be subject to the requirements set forth by the California Energy Code (Title 24, Part 6 CCR). Compliance with the applicable lighting and energy requirements established by the California Energy Code would ensure that light and glare from the Project will not spillover onto adjacent land uses. Specifically, Section 132 of Title 24, Part 6 CCR regulates lighting characteristics such as maximum power and brightness, shielding, and sensor controls to turn lighting on and off. These standards require that outdoor lighting be automatically controlled so that it is turned off during daytime hours and during other times when not needed. Therefore, with adherence to the aforementioned requirements, impacts associated with light would be less than significant.

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Exhibit 3.1-1
Viewpoint Key Map

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Exhibit 3.1-2
View 1 - Looking West From Westbridge Lane

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Exhibit 3.1-3
Simulation 1 - Looking West From Westbridge Lane

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Exhibit 3.1-4
View 2 - Looking Northeast from Happy Valley Road

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Exhibit 3.1-5
Simulation 2 - Looking Northeast from Happy Valley Road

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Exhibit 3.1-6
View 3 - Looking East from Alisal Street

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Exhibit 3.1-7
Simulation 3 - Looking East from Alisal Street

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Exhibit 3.1-8
View 4 - Looking Southeast from Alisal Street

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Exhibit 3.1-9
Simulation 4 - Looking Southeast from Alisal Street

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Exhibit 3.1-10
View 5 - Looking Southeast from Laura Lane

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Exhibit 3.1-11
Simulation 5 - Looking Southeast from Laura Lane

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### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

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# 3.2 - Air Quality

## 3.2.1 - Introduction

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on modeling performed by FirstCarbon Solutions (FCS). The most recent version of CalEEMod (version 2016.3.2) was used to quantify project-related emissions. In addition, the most recent version of the United States Environmental Protection Agency (EPA) AERMOD air dispersion model (version 16216r) was used in the air dispersion model assessment of project health impacts. The air quality analysis, including model output, is provided in Appendix B. This analysis follows the Bay Area Air Quality Management District (BAAQMD) recommendations for preparing an air quality analysis under CEQA (BAAQMD 2017).[1]

## 3.2.2 - Environmental Setting

### San Francisco Bay Area Air Basin

The project site is located in the City of Pleasanton in Alameda County and is within the San Francisco Bay Area Air Basin (Air Basin). The Air Basin consists of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara counties, the western portion of Solano County, and the southern portion of Sonoma County. The regional climate within the Air Basin is considered semiarid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. A wide range of emissions sources—such as dense population centers, heavy vehicular traffic and industry—and meteorology influence the air quality within the Air Basin. Air quality in the Air Basin is regulated by the EPA, the California Air Resources Board (ARB), and the BAAQMD. The regulatory responsibilities of these agencies are discussed in the Regulatory Framework section.

Regional and local air quality are impacted by dominant airflows, topography, atmospheric inversions, location, season, and time of day. These characteristics are discussed in relation to the Air Basin.

### Local Climate

A semi-permanent, high-pressure area, the Pacific High, centered over the northeastern Pacific Ocean dominates the summer climate of the West Coast. Because this high-pressure cell is persistent, storms rarely affect the California coast during the summer. Thus, the conditions that persist along the coast of California during summer are a northwest airflow and negligible precipitation. A thermal low-pressure area from the Sonoran-Mojave Desert also causes air to flow onshore over the San Francisco Bay Area during much of the summer.

The steady northwesterly flow around the eastern edge of the Pacific High exerts stress on the ocean surface along the west coast. This induces upwelling of cold water from below. Upwelling produces a band of cold water off San Francisco that is approximately 80 miles wide. During July, the surface

[1] Bay Area Air Quality Management District (BAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed September 22, 2017.

waters off San Francisco are 3 degrees Fahrenheit (°F) cooler than those off Vancouver, British Columbia, more than 900 miles to the north. Air approaching the California coast, already cool and moisture-laden from its long trajectory over the Pacific Ocean, is further cooled as it flows across this cold bank of water near the coast, thus accentuating the temperature contrast across the coastline. This cooling is often sufficient to produce condensation—a high incidence of fog and stratus clouds along the Northern California coast in summer.

In summer, the northwest winds to the west of the Pacific coastline are drawn into the interior through the gap in the western Coast Ranges, known as the Golden Gate, and over the lower portions of the San Francisco Peninsula. Immediately to the south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more nearly from the west as they stream through the Golden Gate. This channeling of the flow through the Golden Gate produces a jet that sweeps eastward but widens downstream, producing southwest winds at Berkeley and northwest winds at San José; a branch curves eastward through the Carquinez Straits and into the Central Valley. Wind speeds may be locally strong in regions where air is channeled through a narrow opening such as the Golden Gate, the Carquinez Strait, or San Bruno Gap. For example, the average wind speed at San Francisco International Airport from 3 a.m. to 4 p.m. in July is about 20 miles per hour (mph), compared with only about 8 mph at San José and less than 7 mph at the Farallon Islands.

The sea breeze between the coast and the Central Valley commences near the surface along the coast in late morning or early afternoon; it may first be observed only through the Golden Gate. Later in the day, the layer deepens and intensifies while spreading inland. As the breeze intensifies and deepens, it flows over the lower hills farther south along the peninsula. This process frequently can be observed as a bank of stratus clouds “rolling over” the coastal hills on the west side of the bay. The depth of the sea breeze depends in large part upon the height and strength of the inversion. The generally low elevation of this stable layer of air prevents marine air from flowing over the coastal hills. It is unusual for the summer sea breeze to flow over terrain exceeding 2,000 feet in elevation.

In winter, the Air Basin experiences periods of storminess, moderate-to-strong winds, and periods of stagnation with very light winds as the Pacific High weakens. Winter stagnation episodes are characterized by outflow from the Central Valley, nighttime drainage flows in coastal valleys, weak onshore flows in the afternoon, and otherwise light and variable winds.

A primary factor in air quality is the mixing depth (the vertical air column available for dilution of contaminant sources). Generally, the temperature of air decreases with height, creating a gradient from warmer air near the ground to cooler air at elevation. This is caused by most of the sun’s energy being converted to sensible heat at the ground, which in turn warms the air at the surface. The warm air rises in the atmosphere, where it expands and cools. Sometimes, however, the temperature of air actually increases with height. This condition is known as temperature inversion, because the temperature profile of the atmosphere is “inverted” from its usual state. Over the Air Basin, the frequent occurrence of temperature inversions limits mixing depth and, consequently, limits the availability of air for dilution.

## Local Air Quality

Air quality is a function of both the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions such as wind speed, wind direction, and air temperature inversions interact with the physical features of the landscape to determine the movement and dispersal of air pollutant emissions and, consequently, their effects on air quality.

The local air quality can be evaluated by reviewing relevant air pollution concentrations near the project area. Table 3.2-1 summarizes 2014–2016 published monitoring data available near the project site, which is the most recent 3-year period available. The table displays data from the Livermore-793 Rincon Avenue monitoring station (located approximately 5.7 miles northeast of the project site). The data shows that during the past few years, the project area has exceeded the standards for ozone (state and national) and $PM_{2.5}$ (national). The data in the table reflects the concentration of the pollutants in the air, measured using air monitoring equipment. This differs from emissions, which are calculations of a pollutant being emitted from an emission source over a certain period. No recent monitoring data for Alameda County was available for CO, $SO_2$, and $PM_{10}$. Generally, no monitoring for specific pollutants indicates that for these pollutants are no longer likely to exceed ambient air quality standards.

### Table 3.2-1: Air Quality Monitoring Summary

| Air Pollutant | Averaging Time | Item | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Ozone[1] | 1 Hour | Max 1 Hour (ppm) | 0.093 | **0.105** | **0.102** |
| | | Days > State Standard (0.09 ppm) | 0 | **1** | **2** |
| | 8 Hour | Max 8 Hour (ppm) | **0.080** | **0.082** | **0.085** |
| | | Days > State Standard (0.07 ppm) | 7 | **7** | **6** |
| | | Days > National Standard (0.075 ppm) | **4** | **1** | **2** |
| Carbon monoxide (CO) | 8 Hour | Max 8 Hour (ppm) | ND | ND | ND |
| | | Days > State Standard (9.0 ppm) | ND | ND | ND |
| | | Days > National Standard (9 ppm) | ND | ND | ND |
| Nitrogen dioxide ($NO_2$)[1] | Annual | Annual Average (ppm) | 0.01 | 0.01 | 0.008 |
| | 1 Hour | Max 1 Hour (ppm) | 0.052 | 0.053 | 0.049 |
| | | Days > State Standard (0.18 ppm) | 0 | 0 | 0 |
| Sulfur dioxide ($SO_2$) | Annual | Annual Average (ppm) | ND | ND | ND |
| | 24 Hour | Max 24 Hour (ppm) | ND | ND | ND |
| | | Days > State Standard (0.04 ppm) | ND | ND | ND |
| Inhalable coarse particles ($PM_{10}$) | Annual | Annual Average (µg/m$^3$) | ND | ND | ND |
| | 24 hour | 24 Hour (µg/m$^3$) | ND | ND | ND |
| | | Days > State Standard (50 µg/m$^3$) | ND | ND | ND |
| | | Days > National Standard (150 µg/m$^3$) | ND | ND | ND |

## Table 3.2-1 (cont.): Air Quality Monitoring Summary

| Air Pollutant | Averaging Time | Item | 2014 | 2015 | 2016 |
|---|---|---|---|---|---|
| Fine particulate matter ($PM_{2.5}$)[1] | Annual | Annual Average (µg/m$^3$) | ND | 8.8 | 7.5 |
| | 24 Hour | 24 Hour (µg/m$^3$) | **42.9** | 31.1 | 22.3 |
| | | Days > National Standard (35 µg/m$^3$) | **1.2** | 0.0 | 0.0 |

Notes:
> = exceed ppm = parts per million µg/m$^3$ = micrograms per cubic meter
ID = insufficient data ND = no data max = maximum
**Bold** = exceedance
State Standard = California Ambient Air Quality Standard
National Standard = National Ambient Air Quality Standard
[1] Livermore-793 Rincon Avenue Air Monitoring Station
Source: California Air Resources Board (ARB). 2016a. Historical Air Quality, Top 4 Summary.
California Air Resources Board (ARB). 2016b. Air Quality Trend Summaries: Livermore-793 Rincon Avenue Air Monitoring Station.

### Sensitive Receptors

The BAAQMD defines sensitive receptors to include residential dwellings, including apartments, houses, and condominiums; schools, colleges, and universities; daycare centers and hospitals, and senior-care facilities. The nearest sensitive receptors are residences located adjacent to the project site to the north, west, southwest, south, and southeast. The closest sensitive receptor is an existing residence located approximately 68 feet south of the site at 2315 Westbridge Lane.

### Attainment Status

The EPA and the ARB designate air basins where ambient air quality standards are exceeded as "non-attainment" areas. If standards are met, the area basin is designated an "attainment" area. If there are inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." National non-attainment areas are further designated marginal, moderate, serious, severe, or extreme as a function of deviation from standards. Each standard has a different definition, or "form" of what constitutes attainment, based on specific air quality statistics. For example, the federal 8-hour CO standard is not to be exceeded more than once per year; therefore, an area is in attainment of the CO standard if no more than one 8-hour ambient air monitoring values exceeds the threshold per year. In contrast, the federal annual $PM_{2.5}$ standard is met if the 3-year average of the annual average $PM_{2.5}$ concentration is less than or equal to the standard.

The current state and national attainment designations for the Air Basin are shown in Table 3.2-2. The Air Basin is designated non-attainment for the state ozone, $PM_{10}$, and $PM_{2.5}$, standards, non-attainment for the national ozone and $PM_{2.5}$ standards, and unclassified for the national $PM_{10}$ standard.

**Table 3.2-2: San Francisco Bay Area Air Basin Attainment Status**

| Pollutant | State Status | National Status |
|---|---|---|
| Ozone | Non-attainment | Non-attainment |
| Carbon monoxide | Attainment | Attainment |
| Nitrogen dioxide | Attainment | Attainment |
| Sulfur dioxide | Attainment | Attainment |
| $PM_{10}$ | Non-attainment | Unclassified |
| $PM_{2.5}$ | Non-attainment | Non-attainment |
| Lead | Attainment | Unclassified/Attainment |

Notes:
$PM_{10}$ = particulate matter with aerodynamic diameter less than 10 microns
$PM_{2.5}$ = particulate matter with aerodynamic diameter less than 2.5 microns
Source: BAAQMD, 2017

## 3.2.3 - Regulatory Framework

Air pollutants are regulated primarily to protect human health and for secondary effects such as visibility and property damage from pollutant deposition. The Clean Air Act of 1970 tasks the EPA with setting air quality standards. The State of California also sets air quality standards that are in some cases more stringent than federal standards, and address additional pollutants. The following section describes these federal and state standards and the health effects of the regulated pollutants.

### Clean Air Act

Congress established much of the basic structure of the Clean Air Act (CAA) in 1970, and made major revisions in 1977 and 1990. Six common air pollutants (also known as criteria pollutants) are addressed in the CAA. These are particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead. The EPA calls these pollutants criteria air pollutants because it regulates them by developing human health-based and/or environmentally based criteria (science-based guidelines) for setting permissible levels. The set of limits based on human health are called primary standards. Another set of limits intended to prevent environmental and property damage are called secondary standards (EPA 2014).[2] The federal standards are called National Ambient Air Quality Standards (NAAQS). The air quality standards provide benchmarks for determining whether air quality is healthy at specific locations and whether development activities will cause or contribute to a violation of the standards. The criteria pollutants are:

- Ozone
- Nitrogen dioxide ($NO_2$)
- Lead
- Particulate matter ($PM_{10}$ and $PM_{2.5}$)
- Carbon monoxide (CO)
- Sulfur dioxide

[2] U.S. Environmental Protection Agency (EPA). 2014. Clean Air Act Requirements and History. Website: https://www.epa.gov/clean-air-act-overview/clean-air-act-requirements-and-history. Accessed April 25, 2016.

The federal standards were set to protect public health, including that of sensitive individuals. Periodically, the EPA is tasked with updating the standards as more medical research is available regarding the health effects of the criteria pollutants. Primary federal standards are the levels of air quality necessary, with an adequate margin of safety, to protect the public health.

## California Clean Air Act

The California Legislature enacted the California Clean Air Act (CCAA) in 1988 to address air quality issues of concern not adequately addressed by the federal CAA at the time. California's air quality problems were and continue to be some of the most severe in the nation and required additional actions beyond the federal mandates. The ARB administers California Ambient Air Quality Standards (CAAQS) for the 10 air pollutants designated in the CCAA. The 10 state air pollutants include the six federal standards listed above as well visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride. The EPA authorized California to adopt its own regulations for motor vehicles and other sources that are more stringent than similar federal regulations implementing the CAA. Generally, the planning requirements of the CCAA are more stringent than the federal CAA; therefore, consistency with the CCAA will also demonstrate consistency with the CAA.

## Air Pollutant Description and Health Effects

The federal and state ambient air quality standards, the most relevant effects, the properties, and sources of the pollutants are in Table 3.2-3.

## Table 3.2-3: Description of Air Pollutants

| Air Pollutant | Averaging Time | California Standard | Federal Standard[a] | Most Relevant Effects from Pollutant Exposure | Properties | Sources |
|---|---|---|---|---|---|---|
| Ozone | 1 Hour | 0.09 ppm | — | Irritate respiratory system; reduce lung function; breathing pattern changes; reduction of breathing capacity; inflame and damage cells that line the lungs; make lungs more susceptible to infection; aggravate asthma; aggravate other chronic lung diseases; cause permanent lung damage; some immunological changes; increased mortality risk; vegetation and property damage. | Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), nitrous oxides ($NO_X$), and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind. | Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and $NO_X$) are mobile sources (on-road and off-road vehicle exhaust). |
| | 8 Hour | 0.070 ppm | 0.070 ppm[f] | | | |
| Carbon monoxide (CO) | 1 Hour | 20 ppm | 35 ppm | Ranges depending on exposure: slight headaches; nausea; aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; decreased exercise tolerance in persons with peripheral vascular disease and lung disease; impairment of central nervous system functions; possible increased risk to fetuses; death. | CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood. | CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources. |
| | 8 Hour | 9.0 ppm | 9 ppm | | | |
| Nitrogen dioxide[b] ($NO_2$) | 1 Hour | 0.18 ppm | 0.100 ppm | Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; contributions to atmospheric discoloration; increased visits to hospital for respiratory illnesses. | During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides—$NO_X$ (NO, $NO_2$, $NO_3$, $N_2O$, $N_2O_3$, $N_2O_4$, and $N_2O_5$). $NO_X$ is a precursor to ozone, $PM_{10}$, and $PM_{2.5}$ formation. $NO_X$ can react with compounds to form nitric acid and related small particles and result in PM related health effects. | $NO_X$ is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Nitrogen dioxide forms quickly from $NO_X$ emissions. $NO_2$ concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations. |
| | Annual | 0.030 ppm | 0.053 ppm | | | |

## Table 3.2-3 (cont.): Description of Air Pollutants

| Air Pollutant | Averaging Time | California Standard | Federal Standard[a] | Most Relevant Effects from Pollutant Exposure | Properties | Sources |
|---|---|---|---|---|---|---|
| Sulfur dioxide[c] ($SO_2$) | 1 Hour | 0.25 ppm | 0.075 ppm | Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor. | Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides ($SO_X$) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below state and federal standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and $PM_{10}$. | Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards. |
| | 3 Hour | — | 0.5 ppm | | | |
| | 24 Hour | 0.04 ppm | 0.14 (for certain areas) | | | |
| | Annual | — | 0.030 ppm (for certain areas) | | | |
| Particulate matter ($PM_{10}$) | 24 hour | 50 µg/m$^3$ | 150 µg/m$^3$ | - Short-term exposure (hours/days): irritation of the eyes, nose, throat; coughing; phlegm; chest tightness; shortness of breath; aggravate existing lung disease, causing asthma attacks and acute bronchitis; those with heart disease can suffer heart attacks and arrhythmias.<br>- Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death. | Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. $PM_{10}$ refers to particulate matter that is between 2.5 and 10 microns in diameter, (one micron is one-millionth of a meter). $PM_{2.5}$ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair. | Stationary sources include fuel or wood combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation related sources are from vehicle exhaust and road dust. Secondary particles form from reactions in the atmosphere. |
| | Mean | 20 µg/m$^3$ | — | | | |
| Particulate matter ($PM_{2.5}$) | 24 Hour | — | 35 µg/m$^3$ | | | |
| | Annual | 12 µg/m$^3$ | 12.0 µg/m$^3$ | | | |
| Visibility reducing particles | 8 Hour | See note below[d] | | | | |

## Table 3.2-3 (cont.): Description of Air Pollutants

| Air Pollutant | Averaging Time | California Standard | Federal Standard[a] | Most Relevant Effects from Pollutant Exposure | Properties | Sources |
|---|---|---|---|---|---|---|
| Sulfates | 24 Hour | 25 µg/m$^3$ | — | (a) Decrease in ventilatory function;<br>(b) aggravation of asthmatic symptoms;<br>(c) aggravation of cardio-pulmonary disease;<br>(d) vegetation damage;<br>(e) degradation of visibility;<br>(f) property damage. | The sulfate ion is a polyatomic anion with the empirical formula SO42−. Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water. | Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel. |
| Lead[e] | 30-day | 1.5 µg/m$^3$ | — | Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction, behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs. | Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. Leaded gasoline was used in motor vehicles until around 1970. Lead concentrations have not exceeded state or federal standards at any monitoring station since 1982. | Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering. |
| | Quarter | — | 1.5 µg/m$^3$ | | | |
| | Rolling 3-month average | — | 0.15 µg/m$^3$ | | | |
| Vinyl chloride[e] | 24 Hour | 0.01 ppm | — | Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers. | Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor. | Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites. |

## Table 3.2-3 (cont.): Description of Air Pollutants

| Air Pollutant | Averaging Time | California Standard | Federal Standard[a] | Most Relevant Effects from Pollutant Exposure | Properties | Sources |
|---|---|---|---|---|---|---|
| Hydrogen sulfide | 1 Hour | 0.03 ppm | — | High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema. | Hydrogen sulfide (H2S) is a flammable, colorless, poisonous gas that smells like rotten eggs. | Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal). |
| Volatile organic compounds (VOC) | | There are no State or federal standards for VOCs because they are not classified as criteria pollutants. | | Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, the kidneys, and the central nervous system. Many VOCs have been classified as toxic air contaminants. | Reactive organic gases (ROGs), or VOCs, are defined as any compound of carbon—excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate—that participates in atmospheric photochemical reactions. Although there are slight differences in the definition of ROGs and VOCs, the two terms are often used interchangeably. | Indoor sources of VOCs include paints, solvents, aerosol sprays, cleansers, tobacco smoke, etc. Outdoor sources of VOCs are from combustion and fuel evaporation. A reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are transformed into organic aerosols in the atmosphere, which contribute to higher $PM_{10}$ and lower visibility. |
| Diesel particulate matter (DPM) | | There are no ambient air quality standards for DPM. | | Some short-term (acute) effects of DPM exposure include eye, nose, throat, and lung irritation, coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung | Diesel PM is a source of $PM_{2.5}$—diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which consists of compounds such as hydrocarbons and their | Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. Typically, the main source of DPM is from combustion of diesel fuel in diesel-powered engines. Such engines are in on-road vehicles such as diesel trucks, off-road construction vehicles, diesel electrical generators, and |

## Table 3.2-3 (cont.): Description of Air Pollutants

| Air Pollutant | Averaging Time | California Standard | Federal Standard[a] | Most Relevant Effects from Pollutant Exposure | Properties | Sources |
|---|---|---|---|---|---|---|
| | | | | cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure. | derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust. | various pieces of stationary construction equipment. |

Notes:
ppm = parts per million (concentration) µg/m$^3$ = micrograms per cubic meter Annual = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter

[a] Federal standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3-Hour $SO_2$, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[b] To attain the 1-hour nitrogen dioxide national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 parts per billion (0.100 ppm).

[c] On June 2, 2010, a new 1-hour $SO_2$ standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 $SO_2$ national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated non-attainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[d] Visibility reducing particles: In 1989, ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

[e] ARB has identified lead and vinyl chloride as “toxic air contaminants” with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[f] The EPA Administrator approved a revised 8-hour ozone standard of 0.07 ppb on October 1, 2015. The new standard went into effect 60 days after publication of the Final Rule in the Federal Register. The Final Rule was published in the Federal Register on October 26, 2015 and became effective on December 28, 2015.

Source of effects, properties, and sources: South Coast Air Quality Management District 2007a; California Environmental Protection Agency 2002; California Air Resources Board 2009; United States Environmental Protection Agency 2003, 2009a, 2009b, 2010, 2011a, and 2012; National Toxicology Program 2011a and 2011b. Source of standards: California Air Resources Board 2013c.

Several pollutants listed in Table 3.2-3 are not addressed in this analysis. Analysis of lead is not included in this report because no new sources of lead emissions are anticipated with the project. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed as $PM_{10}$ and $PM_{2.5}$. No components of the project would result in sulfate, vinyl chloride or hydrogen sulfide emissions in any substantial quantity.

## Toxic Air Contaminants Health Effects

A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations. In general, for those TACs that may cause cancer, there are thresholds set by regulatory agencies below which adverse health impacts are not expected to occur. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

According to the California Almanac of Emissions and Air Quality, the majority of the estimated health risk from TACs for the State of California can be attributed to relatively few compounds, the most important of which is diesel particulate matter (DPM) from diesel-fueled engines.

### *Diesel Particulate Matter*

The ARB identified PM emissions from diesel-fueled engines as a TAC in August 1998 under California's TAC program. The State of California, after a 10-year research program, determined in 1998 that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic (long-term) health risk. According to ARB's 2013 Almanac, on-road diesel-fueled vehicles contribute approximately 42 percent of the statewide total inventory, with an additional 55 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. The remaining DPM inventory was generated by stationary point sources and aggregated stationary sources.

## Asbestos

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. Exposure to asbestos can occur during demolition or remodeling of buildings that were constructed prior to the 1977 ban on asbestos for use in buildings. Exposure to naturally occurring asbestos can occur during soil-disturbing activities in areas with deposits present.

## Federal Regulatory Responsibilities

Air pollutants are regulated at the national, state, and air basin or county level; each agency has a different level of regulatory responsibility. The EPA regulates at the national level. The ARB regulates at the state level. The BAAQMD regulates at the air basin level.

The EPA is responsible for national and interstate air pollution issues and policies. The EPA sets national vehicle and stationary source emission standards, oversees approval of all State

Implementation Plans, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards, also known as the federal standards described earlier.

A State Implementation Plan is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain federal standards. The State Implementation Plan for the State of California is administered by the ARB, which has overall responsibility for statewide air quality maintenance and air pollution prevention. California's State Implementation Plan incorporates individual federal attainment plans for regional air districts—an air district prepares their federal attainment plan, which is sent to ARB to be approved and incorporated into the California State Implementation Plan. Federal attainment plans include the technical foundation for understanding air quality (e.g., emission inventories and air quality monitoring), control measures and strategies, and enforcement mechanisms.

Areas designated non-attainment must develop air quality plans (AQPs) and regulations to achieve standards by specified dates, depending on the severity of the exceedances. For much of the country, implementation of federal motor vehicle standards and compliance with federal permitting requirements for industrial sources are adequate to attain air quality standards on schedule. For many areas of California, however, additional state and local regulation is required to achieve the standards. Regulations adopted by California are described below.

## California Regulatory Responsibilities

### *Low-Emission Vehicle Program*

The ARB first adopted Low-Emission Vehicle (LEV) program standards in 1990. These first LEV standards ran from 1994 through 2003. LEV II regulations, running from 2004 through 2010, represent continuing progress in emission reductions. As the State's passenger vehicle fleet continues to grow and more sport utility vehicles and pickup trucks are used as passenger cars rather than work vehicles, the more stringent LEV II standards were adopted to provide reductions necessary for California to meet federally mandated clean air goals outlined in the 1994 State Implementation Plan. In 2012, ARB adopted the LEV III amendments to California's Low-Emission Vehicle (LEV) regulations. These amendments, also known as the Advanced Clean Car Program include more stringent emission standards for model years 2017 through 2025 for both criteria pollutants and GHGs for new passenger vehicles (ARB 2013).[3]

### *On-Road Heavy-Duty Vehicle Program*

The ARB has adopted standards for emissions from various types of new on-road heavy-duty vehicles. Section 1956.8, Title 13, California Code of Regulations contains California's emission standards for on-road heavy-duty engines and vehicles, and test procedures. ARB has also adopted programs to reduce emissions from in-use heavy-duty vehicles including the Heavy-Duty Diesel Vehicle Idling Reduction Program, the Heavy-Duty Diesel In-Use Compliance Program, the Public Bus Fleet Rule and Engine Standards, and the School Bus Program and others (ARB 2013b).[4]

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[3] California Air Resources Board (ARB). 2013. Clean Car Standards—Pavley, Assembly Bill 1493. Website: http://www.arb.ca.gov/cc/ccms /ccms.htm. Accessed February 14, 2017.

[4] California Air Resources Board (ARB). 2013b. The California Almanac of Air Quality and Emissions—2013 Edition. Website:

### *ARB Regulation for In-Use Off-Road Diesel Vehicles*

On July 26, 2007, the ARB adopted a regulation to reduce DPM and nitrous oxides ($NO_X$) emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation limits idling to no more than five consecutive minutes, requires reporting and labeling, and requires disclosure of the regulation upon vehicle sale. The ARB is enforcing that part of the rule with fines up to $10,000 per day for each vehicle in violation. Performance requirements of the rule are based on a fleet's average $NO_X$ emissions, which can be met by replacing older vehicles with newer, cleaner vehicles or by applying exhaust retrofits. The regulation was amended in 2010 to delay the original timeline of the performance requirements, making the first compliance deadline January 1, 2014 for large fleets (over 5,000 horsepower), 2017 for medium fleets (2,501-5,000 horsepower), and 2019 for small fleets (2,500 horsepower or less).

The latest amendments to the Truck and Bus regulation became effective on December 31, 2014. The amended regulation requires diesel trucks and buses that operate in California to be upgraded to reduce emissions. Newer heavier trucks and buses must meet PM filter requirements beginning January 1, 2012. Lighter and older heavier trucks must be replaced starting January 1, 2015. By January 1, 2023, nearly all trucks and buses will need to have 2010 model year engines or equivalent.

The regulation applies to nearly all privately and federally owned diesel fueled trucks and buses and to privately and publicly owned school buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds. The regulation provides a variety of flexibility options tailored to fleets operating low use vehicles, fleets operating in selected vocations like agricultural and construction, and small fleets of three or fewer trucks (ARB 2015b).[5]

### *ARB Airborne Toxic Control Measure for Asbestos*

In July 2001, the ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize emissions of naturally occurring asbestos. The regulation requires application of best management practices (BMPs) to control fugitive dust in areas known to have naturally occurring asbestos and requires notification to the local air district prior to commencement of ground-disturbing activities. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The measure also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity. Review of the Department of Conservation maps indicates that no ultramafic rock has been found near the project site.

### *Diesel Risk Reduction Plan*

The ARB's Diesel Risk Reduction Plan has led to the adoption of new state regulatory standards for all new on-road, off-road, and stationary diesel-fueled engines and vehicles to reduce DPM emissions by about 90 percent overall from year 2000 levels. The projected emission benefits associated with

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http://www.arb.ca.gov/aqd/almanac/almanac13/almanac13.htm. Accessed February 14, 2017.

[5] California Air Resources Board (ARB). 2015b. On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation. Website: http://www.arb.ca.gov/msprog/onrdiesel/onrdiesel.htm. Accessed September 22, 2017.

the full implementation of this plan, including federal measures, are reductions in DPM emissions and associated cancer risks of 75 percent by 2010, and 85 percent by 2020 (ARB 2000).[6]

## Local Regulatory Responsibilities

### *BAAQMD*

The agency for air pollution control for the Air Basin is the BAAQMD. The BAAQMD is responsible for controlling emissions primarily from stationary sources and maintains air quality monitoring stations throughout the Basin. BAAQMD, in coordination with Metropolitan Transportation Commission and the Association of Bay Area Governments, is also responsible for developing, updating, and implementing the Bay Area Clean Air Plan for the Air Basin. A clean air plan is a plan prepared and implemented by an air pollution district for a county or region designated non-attainment of the national and/or CAAQS. The term non-attainment area is used to refer to an air basin where one or more ambient air quality standards are exceeded. The clean air plan, once submitted to and approved by the ARB, becomes an integral part of the State Implementation Plan (SIP).

In addition, the BAAQMD adopted its 2017 Clean Air Plan (2017 CAP) and updated its California Environmental Quality Act Air Quality Guidelines (Guidelines) in May 2017 to assist local jurisdictions and lead agencies in complying with the requirements of CEQA regarding potentially adverse impacts to air quality. The 2017 CEQA Guidelines were updated to include thresholds of significance (Thresholds) adopted by the BAAQMD Board in May of 2012.

This assessment is based on BAAQMD's 2017 CEQA thresholds. In accordance with CEQA Guidelines Section 15064.7 (Thresholds of Significance), the City exercises its own discretion to use the significance thresholds in the BAAQMD's CEQA thresholds based on substantial evidence contained in BAAQMD's record for adoption of the thresholds (which is relied on and incorporated herein). Accordingly, this assessment uses the thresholds and methodologies from BAAQMD's May 2017 CEQA Air Quality Guidelines to determine the potential impacts of the project on the existing environment. The significance thresholds used in this analysis are based on BAAQMD standards and as set forth in Table 3.2-8 below.

*Current Air Quality Plans*

A State Implementation Plan (SIP) is a federal requirement; each state prepares one to describe existing air quality conditions and measures that will be followed to attain and maintain the national ambient air quality standards. In addition, in California, state ozone standards have planning requirements. However, state $PM_{10}$ standards have no attainment planning requirements, but air districts must demonstrate that all measures feasible for the area have been adopted.

**Ozone Plans**

Because the Air Basin is non-attainment for the federal and state ozone standards, the BAAQMD prepared an Ozone Attainment Demonstration Plan to satisfy the federal 1-hour ozone planning requirement and a Clean Air Plan to satisfy the State 1-hour ozone planning requirement. The EPA revoked the 1-hour ozone standard and adopted an 8-hour ozone standard.

[6] California Air Resources Board (ARB). 2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-fueled Engines and Vehicles. Website: http://www.arb.ca.gov/diesel/documents/rrpfinal.pdf. Accessed September 22, 2017.

On April 19, 2017, the BAAQMD adopted the final Bay Area 2017 Clean Air Plan. The 2017 Clean Air Plan was prepared by the BAAQMD in cooperation with the Metropolitan Transportation Commission and the Association of Bay Area Governments. The goals of the 2017 CAP are to reduce regional air pollutants and climate pollutants to improve the health of Bay Area residents for the next decades. The 2017 Clean Air Plan aims to lead the region into a post-carbon economy, continue progress toward attaining all state and federal air quality standards, and eliminate health risk disparities from air pollution exposure in Bay Area communities. The plan includes 85 distinct control measures to help the region reduce air pollutants and has a long-term strategic vision that forecasts what a clean air Bay Area will look like in year 2050. The 2017 CAP envisions a future where by the year 2050:

- Buildings will be energy efficient—heated, cooled and powered by renewable energy.
- Transportation will be a combination of electric vehicles, both shared and privately-owned; autonomous public transit fleets; with a large share of trips by bicycling, walking and transit.
- The Bay Area will be powered by clean, renewable electricity and will be a leading incubator and producer of clean energy technologies leading the world in the carbon-efficiency of our products.
- Bay Area residents will have developed a low-carbon lifestyle by driving electric vehicles, living in zero net energy homes, eating low-carbon foods and purchasing goods and services with low carbon content.
- Waste will be greatly reduced, waste products will be re-used or recycled and all organic waste will be composted and put to productive use.

The focus of control measures includes aggressively targeting the largest source of GHG, ozone pollutants and particulate matter emissions—transportation. This includes more incentives for electric vehicle infrastructure, off-road electrification projects such as Caltrain and shore power at ports, and reducing emissions from trucks, school buses, marine vessels, locomotives and off-road equipment. Additionally, the BAAQMD will continue to work with regional and local governments to reduce vehicle miles traveled through the further funding of rideshare, bike and shuttle programs.

*Particulate Matter Plans*

The Air Basin is also designated non-attainment for the State $PM_{10}$ and $PM_{2.5}$ standards, but it is currently unclassified for the federal $PM_{10}$ standard and non-attainment for federal $PM_{2.5}$ standards. The EPA lowered the 24-hour $PM_{2.5}$ standard from 65 $\mu g/m^3$ to 35 $\mu g/m^3$ in 2006 and designated the Air Basin as non-attainment for the new $PM_{2.5}$ standard effective December 14, 2009.

On December 8, 2011, the ARB submitted a “clean data finding” request to the EPA on behalf of the BAAQMD. If the clean data finding request is approved, then EPA guidelines provide that the region can fulfill federal $PM_{2.5}$ SIP requirements by preparing either a redesignation request and a $PM_{2.5}$ maintenance plan, or a “clean data” SIP submittal. Because peak $PM_{2.5}$ levels can vary from year to year based on natural, short-term changes in weather conditions, the BAAQMD believes that it

would be premature to submit a redesignation request and $PM_{2.5}$ maintenance plan at this time. Therefore, the BAAQMD will prepare a "clean data" SIP to address the required elements, including:

- An emission inventory for primary $PM_{2.5}$, as well as precursors to secondary PM formation
- Amendments to the BAAQMD's New Source Review regulation to address $PM_{2.5}$

## Local Regulatory Responsibilities

### *City of Pleasanton*

*General Plan*

The City of Pleasanton General Plan establishes the following goals, policies, and programs in its Air Quality and Climate Change Element that are relevant to air quality:

- **Goal 1:** Implement a proactive approach, and use available technology to maintain and improve air quality within Pleasanton and the region to protect the public health, safety, and welfare.
- **Goal 2:** Promote sustainable development and planning to minimize additional air emissions.
- **Policy 1:** Adhere to federal and State air quality standards for local pollutants of concern.
  - **Program 1.1:** Incorporate measures in conditions of approval for development projects to reduce grading, construction, and operations-related air quality impacts.
  - **Program 1.2:** Support State and federal legislation that promotes improvements in air quality.
  - Also implement programs from the Hazardous Materials section of the Public Safety Element.
- **Policy 2:** Support development plans that reduce mobile-source emissions by reducing vehicle trips and vehicle miles traveled.
- **Goal 2:** Promote sustainable development and planning to minimize additional air emissions.
  - Implement programs from the Land Use Element to provide mixed-use developments, locate high-density uses near transit facilities, and provide neighborhood-serving retail uses convenient to residential neighborhoods. These programs would reduce vehicle trips and vehicle miles traveled, thus reducing air-pollutant emissions.
- **Policy 3:** Separate air pollution sensitive land uses from sources of air pollution.
  - **Program 3.1:** Locate new air pollution point sources, such as manufacturing and extracting facilities, away from residential areas and other sensitive land uses following the California Air Resource Board's recommendations.
  - **Program 3.2**: Locate new sensitive receptors, such as residences (including residential care and assisted living facilities for the elderly), childcare centers, schools, playgrounds, and medical facilities away from point sources of air pollution and busy traffic corridors following the California Air Resource Board's recommendations.
  - **Program 3.3:** Require site specific studies of air quality health risk for development that would place sensitive receptors closer than 500 feet from the edge of a freeway or close to a significant point source of air pollution.
- **Policy 4:** Reduce air pollution from motor-vehicle trips and vehicle-miles traveled.
  - **Program 4.1:** Develop standards for the design and use of new drive-through businesses to minimize adverse impacts on air quality. Public education and the use of new technologies should be considered as part of this program.
  - To reduce vehicle miles traveled with commensurate reductions in air pollution and climate change, implement Transportation Demand Management (TDM) programs from the

Circulation Element, including the addition of local and regional bicycle lanes. Also implement Circulation Element measures to facilitate the free flow of vehicular traffic, including continually updating computer-control technology for traffic lights. In order to shorten the distance of worker commutes, also implement programs from the Housing Element to provide mixed-use development and to provide housing opportunities for Pleasanton workers of all socioeconomic levels.

- **Policy 5:** Review proposed projects for their potential to impact air quality conditions.
  - **Program 5.1:** Include air quality as a factor in the City's environmental review process. Encourage development plans which minimize negative impacts on air quality.
  - **Program 5.2:** Require projects which generate high levels of air pollutants, such as manufacturing facilities and hazardous waste handling operations, to incorporate air quality mitigations in their design.
  - **Program 5.3:** Adopt an ordinance regulating burning indoors and outdoors, including fireplaces, wood-burning stoves, and fire pits. The ordinance may consider allowable hours and setbacks from neighbors.
- **Policy 6:** Reduce air pollution and the production of greenhouse gases by increasing energy efficiency, conservation, and the use of renewable resources.
  - **Program 6.1:** Develop a Greenhouse Gas (GHG) Emissions Reduction Plan and/or Climate Action Plan for the City to control and reduce net GHG emissions and the effects of climate change. Development of this plan(s) shall include the following steps: (1) conduct a baseline analysis (GHG emissions inventory): (2) adopt an emissions reduction target; (3) develop strategies and actions for reducing emissions; (4) develop strategies and actions for adapting to climate change; (5) implement strategies and actions; and (6) monitor emissions and verify results a minimum of every five years starting in 2015.
  - **Program 6.2:** Adopt standard methodology for estimating greenhouse gas emissions from development projects and utilize this methodology as part of the project review process.
  - **Program 6.3:** For development approved prior to adoption of a Climate Action Plan, require the following Best Management practices:
    - **BMP #1:** Single- and multi-family residential and commercial development to comply with the City of Pleasanton's Green Building Ordinance. As far as feasible, residential projects should incorporate: resource efficient landscaping, energy efficient hot water distribution systems; high efficiency toilets and other low flow plumbing fixtures; high efficiency heating and cooling systems; pre-plumbing for solar water heating; installation of wiring conduit for future photovoltaic systems; installation of Energy Star appliances; and Green Points in the Community Design and Planning category.
    - **BMP#2:** Development shall incorporate energy efficient appliances and systems that meet Energy Star standards.
    - **BMP#3:** Where feasible, incorporate solar roofs (or other alternative energy measures) into commercial development sufficient to meet 12.5 percent of the building's annual energy usage. Calculations of energy savings may be prepared at the construction drawing stage. Where feasible, residential development to be solar-ready, including proper solar orientation, electrical conduit installed for solar electric system wiring, plumbing installed for solar hot water system, and space provided for solar hot water storage tank.

- **BMP#4:** Require transit and bicycle/pedestrian connections in new development, where feasible.
- **BMP#5:** For commercial/industrial projects, prepare and implement a voluntary Trip Reduction Plan, using the resources available through the City of Pleasanton's Transportation Systems Management program as described in Chapter 17.24 of the Pleasanton Municipal Code. Trip reduction goal of 15 percent within five years and 25 percent within 10 years, compared to "business as usual."
- **BMP# 6:** Require priority facilities for alternative-fueled vehicles, such as priority parking and recharging facilities, where feasible.
- **BMP# 7:** Development and demolition to comply with the City's *Construction and Demolition Debris Ordinance* (ordinance currently in draft form)
- **BMP# 8:** In new commercial and multifamily projects, include facilities to accommodate recycling consistent with the City's programs.
- **BMP# 9:** Incorporate "heat island" treatments that include cool roofs, cool pavements, and/or strategically placed shade trees.
  - Implement programs from the Energy Element including those related to green building, such as encouraging passive-solar construction, as well as those related to reducing energy from appliances, equipment, and lighting.
  - Implement programs from the Public Facilities and Community Programs Element to reduce solid waste.
  - Also implement the program in the Water Element to conserve Pleasanton's urban forest as well as programs in the Community Character Element to replace and protect street trees. Tree shade not only helps lower energy use during hot months, most tree species remove air pollutants from the environment.

- **Policy 7:** Provide leadership to Pleasanton residents and businesses by implementing all technology-based air-pollutant-reduction programs that are reasonable and feasible.
  - **Program 7.1:** Adopt a City "Green Fleet" policy to guide the City in purchasing energy efficient and clean vehicles.
  - **Program 7.2:** Continue to properly maintain the City vehicle fleet to insure as-designed vehicle operation. Proper preventative maintenance includes regular tune-ups, filter replacements, and engine diagnosis.
  - **Program 7.3:** As resources allow, continue and increase police bicycle patrols.
  - **Program 7.4:** As the City replaces landscaping equipment, gas cans, street sweepers, and other electrical and mechanical equipment, consider purchasing the least polluting equipment available.
  - **Program 7.5:** Postpone activities that contribute to air emissions on Spare the Air Days. Activities include: use of fossil fuel-powered landscaping equipment; surface coating and paint projects; and refueling vehicles. Reschedule vehicle trips, if feasible, without impacting project deadlines.
  - **Program 7.6:** Adopt a measure requiring large vehicles (gross weight rating of greater than 14,000 pounds) and off-road equipment owned by the City and/or private contractors to restrict engine idling to less than 5 consecutive minutes and to prohibit engine idling in parking lots, where feasible.
- **Policy 8:** Minimize unpleasant odors in residential neighborhoods.

- **Program 8.1:** Continue efforts to have the asphalt plant relocated away from Vineyard Avenue residents.
- **Program 8.2:** Continue working with the Dublin-San Ramon Services District (DSRSD) to ensure that odors from the sewage-treatment plant are minimized and other air emissions meet all regulatory requirements.

- **Policy 9:** Strongly encourage citizen and business participation in reducing air pollution.
  - **Program 9.1:** Provide regional and local air-quality information on the City of Pleasanton's website, including links to the Bay Area Air Quality Management District, the California Air Resources Board, Alameda County Waste Management Authority Stop Waste.org, and other environmental-based internet sites.
  - **Program 9.2:** Establish an air quality public awareness program which includes changes that people can make to minimize air pollution. This program would educate the public and encourage people to choose the cleanest paints and consumer products, and to purchase the most energy-efficient appliances, landscaping equipment, and gas cans. This program would further encourage the public to purchase more energy-efficient vehicles and to properly maintain them.
  - **Program 9.3:** Develop incentives for the public to help reduce air pollution. This includes offering incentive programs for using non-motorized (i.e., pedestrian and bicycle) and low-polluting mobility alternatives.
  - **Program 9.4:** Develop a recognition and awards program for businesses that reduce air pollution.
  - **Program 9.5:** Provide information to the public regarding the importance of Spare the Air Days and how people can make a positive impact on the environment.
  - **Program 9.6:** When the School District replaces landscaping, cleaning, and other fuel-powered equipment, strongly encourage the District to purchase the least polluting equipment available that is feasible.
    - Implement measures from the Circulation Element to encourage public participation in Ride-Share and other public transportation programs.

**Rules**

The BAAQMD establishes and administers a program of rules and regulations that are air plans, as described above, to attain and maintain state and national air quality standards. The rules and regulations that apply to these projects include but are not limited to the following:

- **Regulation 8, Rule 3.** Architectural Coatings. This rule governs the manufacture, distribution, and sale of architectural coatings and limits the reactive organic gases content in paints and paint solvents. Although this rule does not directly apply to the project, it does dictate the VOC content of paint available for use during the construction.

- **Regulation 8, Rule 15.** Emulsified and Liquid Asphalts. Although this rule does not directly apply to the Project, it does dictate the reactive organic gases content of asphalt available for use during the construction through regulating the sale and use of asphalt and limits the VOC content in asphalt.

## 3.2.4 - Methodology for Construction and Operation Emissions

### Model Selection and Guidance

Air pollutant emissions can be estimated by using emission factors and a level of activity. Emission factors are the emission rate of a pollutant given the activity over time; for example, grams of $NO_X$ per horsepower-hour. The ARB has published emission factors for on-road mobile vehicles/trucks in the EMFAC mobile source emissions model and emission factors for off-road equipment and vehicles in the OFFROAD emissions model. The activity factor is a measure of how active a piece of equipment is and can be represented as the amount of material processed, elapsed time that a piece of equipment is in operation, horsepower of a piece of equipment used, vehicle miles traveled, or the amount of fuel consumed in a given amount of time. An air emissions model (or calculator) combines the emission factors and the various levels of activity and outputs the emissions for the various pieces of equipment.

This assessment applied the California Emissions Estimator Model (CalEEMod) version 2016.3.2, developed in collaboration with the South Coast Air Quality Management District and other air districts throughout the State. The CalEEMod model is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with construction and operation from a variety of land uses.

The modeling follows BAAQMD guidance where applicable from its CEQA Air Quality Guidelines. The models used in this analysis are summarized as follows:

- Construction emissions: CalEEMod, version 2016.3.2
- Operational emissions: CalEEMod, version 2016.3.2

### Criteria Pollutants Assessed

The following air pollutants are assessed in this analysis:

- Volatile organic compounds (VOC)
- Nitrogen oxides ($NO_X$)
- Carbon monoxide (CO)
- Sulfur dioxide ($SO_2$)
- Particulate matter less than 10 microns in diameter ($PM_{10}$)
- Particulate matter less than 2.5 microns in diameter ($PM_{2.5}$)

Note that the project would emit ozone precursors VOC and $NO_X$. However, the project would not directly emit ozone, since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

The project would emit ultrafine particles; however, there is currently no standard separate from the $PM_{2.5}$ standards for ultrafine particles and there is no accepted methodology to quantify or assess the significance of such particles.

## Construction Modeling Assumptions

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from both on-site and off-site activities. On-site emissions consist of exhaust emissions from the activity levels of heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly $PM_{10}$) from disturbed soil. Additionally, paving operations and application of architectural coatings would release volatile organic compounds (VOC) emissions. Off-site emissions result from motor vehicle exhaust from delivery vehicles, worker traffic and road dust ($PM_{10}$ and $PM_{2.5}$). The operation of a piece of equipment is tempered by its load factor which is the average power of a given piece of equipment while in operation compared with its maximum rated horsepower. A load factor of 1.0 indicates that a piece of equipment continually operates at its maximum operating capacity. This analysis uses the CalEEMod default load factors for off-road equipment.

### *Construction Schedule*

The project would construct 39 single-family homes and associated amenities in a single construction phase. Construction was assumed to take place 5 days per week and eight hours per day. As a conservative estimate, construction was assumed to begin in October 2018. If the construction schedule moves to later years, construction emissions would decrease compared the emissions generated during the anticipated schedule because of future improvements in technology and compliance with ongoing stringent regulatory requirements; therefore, the construction schedule used in the analysis represents a “worst-case” analysis scenario. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required by the CEQA Guidelines. CalEEMod defaults were used for the durations and construction equipment. The full construction schedule used to estimate emissions is shown in Table 3.2-4.

**Table 3.2-4: Construction Schedule Used to Estimate Emissions**

| Construction Activities | Assumed Construction Schedule | | Working Days |
|---|---|---|---|
| | Start Date | End Date | |
| Site Preparation | 10/1/2018 | 10/26/2018 | 20 |
| Grading | 10/27/2018 | 12/28/2018 | 45 |
| Building Construction | 12/29/2018 | 9/4/2020 | 440 |
| Paving | 9/5/2020 | 10/23/2020 | 35 |
| Architectural Coating | 10/24/2020 | 12/11/2020 | 35 |
| Source: FirstCarbon Solutions and CalEEMod (see Appendix B). | | | |

### *Construction Equipment*

The CalEEMod model contains built-in inventories of construction equipment for a variety of land use construction projects that incorporate estimates of the number of equipment, their age, their horsepower, and the level of emission control equipment from which rates of emissions are

developed. These inventories were developed based on construction surveys for several land use projects. Table 3.2-5 presents the construction equipment used on the project as derived from the CalEEMod model. The CalEEMod default emission control equipment levels were used in this analysis for the estimation of unmitigated emissions from on-site construction equipment.

**Table 3.2-5: Project Construction Equipment Assumptions for all Construction Activities**

| Phase Name | Equipment | Number | Hours per Day | Horsepower | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8 | 247 | 0.40 |
| | Tractors/Loaders/Backhoes | 4 | 8 | 97 | 0.37 |
| Grading | Excavators | 2 | 8 | 158 | 0.38 |
| | Graders | 1 | 8 | 187 | 0.41 |
| | Rubber Tired Dozers | 1 | 8 | 247 | 0.40 |
| | Scrapers | 2 | 8 | 367 | 0.48 |
| | Tractors/Loaders/Backhoes | 2 | 8 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7 | 231 | 0.29 |
| | Forklifts | 3 | 8 | 89 | 0.20 |
| | Generator Sets | 1 | 8 | 84 | 0.74 |
| | Tractors/Loaders/Backhoes | 3 | 7 | 97 | 0.37 |
| | Welders | 1 | 8 | 46 | 0.45 |
| Paving | Pavers | 2 | 8 | 130 | 0.42 |
| | Paving Equipment | 2 | 8 | 132 | 0.36 |
| | Rollers | 2 | 8 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6 | 78 | 0.48 |
| Source: CalEEMod and FirstCarbon Solutions (see Appendix B). | | | | | |

### *Grading*

During grading activities, fugitive dust can be generated from the movement of dirt on the project site. CalEEMod estimates dust from dozers moving dirt around, dust from graders or scrapers leveling the land, and loading or unloading dirt into haul trucks. Each activity is calculated differently in CalEEMod, based on the number of acres traversed by the grading equipment.

Only some pieces of equipment are assumed to generate fugitive dust in CalEEMod. The CalEEMod manual identifies various equipment and the acreage disturbed in an 8-hour day for each piece of equipment:

- Crawler tractors, graders, and rubber tired dozers: 0.5 acre per 8-hour day
- Scrapers: 1 acre per 8-hour day

Therefore, the following acres are the total quantities disturbed per day, per phase, according to the acreage disturbed quantities listed above:

- Site preparation = 1.5 acres per day
- Grading = 3 acres per day

Based on project-specific information, it was assumed that soil would be balanced on-site, and, therefore, there would be no material imported or exported from the project site.

### *Construction Off-site Trips*

Worker vehicle trips are accounted for the construction phases based on 1.25 worker trips per piece of construction equipment. The CalEEMod model defaults for vendor trips, trip length, and vehicle fleet (all heavy-heavy duty trucks) were used. The CalEEMod model defaults for a project in an urban setting in Alameda County were used for the construction trip lengths. Construction trip lengths include a worker trip length of 10.8 miles, a vendor trip length of 7.3, and a hauling trip length of 20 miles. A summary of the construction-related trips is shown in Table 3.2-6.

**Table 3.2-6: Construction Off-site Trips**

| Activity | Construction Trips per Day | | Total Construction Trips |
|---|---|---|---|
| | Worker | Vendor | Haul |
| Site Preparation | 18 | 0 | 0 |
| Grading | 20 | 0 | 0 |
| Building Construction | 75 | 28 | 0 |
| Paving | 15 | 0 | 0 |
| Architectural Coating | 15 | 0 | 0 |
| Source: FirstCarbon Solutions and CalEEMod, see Appendix B. | | | |

## Operation

As a conservative estimate, operations were analyzed assuming full-buildout in 2020. Operational emissions are those emissions that occur when the project commences operations, in this case when the homes are occupied. The major sources are summarized below.

### *Motor Vehicles*

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the project site. The emissions were estimated using the CalEEMod model (version 2016.3.2). Trip generation rates refer to the number of trips a land use generator such as a residential project would generate as project-related traffic moves to and from the trip generator. The average daily trip generation rates for project operations were obtained from the project-specific traffic analysis performed by Fehr & Peers and are consistent with Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition. The Transportation Assessment (Fehr & Peers

2018), included trip rates for weekday and Saturday. As a conservative assumption, Saturday trip rates were applied to Saturday and Sunday trips to estimate criteria pollutant emissions from motor vehicles. Pass-by trips are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the traffic generator. Pass-by trips are not diverted from another roadway. The CalEEMod model defaults pass-by trips were used for this analysis. The CalEEMod model default trip lengths for an urban setting for the Alameda County were used in this analysis. The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline- and diesel-powered vehicles). The CalEEMod model default vehicle fleet mix and emission factors for Alameda County were used for this analysis.

### *Architectural Coatings*

Paints release VOC emissions during application and drying. The residential buildings in the project would be repainted on occasion. The project is required to comply with the BAAQMD Regulation 8, Rule 3—Architectural Coatings. This rule governs the manufacture, distribution, and sale of architectural coatings and limits the reactive organic gases content in paints and paint solvents.

### *Consumer Products*

Consumer products are various solvents used in non-industrial applications, which emit VOCs during their product use. "Consumer Product" means a chemically formulated product used by household and institutional consumers, including but not limited to detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. It does not include other paint products, furniture coatings, or architectural coatings.[7] The default emission factor developed for the CalEEMod model was used.

### *Landscape Equipment*

The CalEEMod model estimated the landscaping equipment using the default assumptions in the model.

### *Electricity*

Electricity used by the project (for lighting, etc.) would result in emissions from the power plants that would generate electricity distributed on the electrical power grid. Electricity emissions estimates are used only in the GHG analysis. The CalEEMod model was used to estimate these emissions from the project.

### *Electricity Consumption*

The CalEEMod model has three categories for electricity consumption: electricity that is impacted by Title 24 regulations, non-Title 24 electricity, and lighting. The Title 24 uses are defined as the major building envelope systems covered by California's Building Code Title 24 Part 6, such as space heating, space cooling, water heating, and ventilation. Lighting is separate since it can be both part and not

[7] California Air Resources Board (ARB). 2011. Regulation for Reducing Emissions from Consumer Products. Website: www.arb.ca.gov/consprod/regs/fro%20consumer%20products%20regulation.pdf. Accessed May 1, 2017.

part of Title 24. Since lighting is not considered as part of the building envelope energy budget, CalEEMod does not consider lighting to have any further association with Title 24 references in the program. Non-Title 24 includes everything else such as appliances and electronics. Total electricity consumption in the CalEEMod model is divided into the three categories. The percentage for each category is determined by using percentages derived from the CalEEMod model default electricity intensity factors. The percentages are then applied to the electricity consumption to result in the values used in the analysis.

***Natural Gas***

The project would generate emissions from the combustion of natural gas for water heaters, heat, etc. The CalEEMod model has two categories for natural gas consumption: Title 24 and non-Title 24. The CalEEMod model defaults were used.

## 3.2.5 - Methodology for Health Risk Assessment

A Health Risk Assessment (HRA) is a guide that helps to determine whether current or future exposures to a chemical or substance in the environment could affect the health of a population. In general, risk depends on the following factors:

- Identify the toxic air contaminants (TACs) that may be present in the air;
- Estimate the amount of TACs released from all sources, or the source of particular concern, using air samples or emission models;
- Estimate concentrations of TACs in air in the geographic area of concern by using dispersion models with information about emissions, source locations, weather, and other factors; and
- Estimate the number of people exposed to different concentrations of the TAC at different geographic locations.

During construction, the project would result in the emissions of TACs that could potentially impact nearby sensitive receptors. The BAAQMD has defined health risk significance thresholds as shown in Table 3.2-8. These thresholds are represented as a cancer risk to the public and a non-cancer hazard from exposures to TACs. Cancer risk represents the probability (in terms of risk per million individuals) that an individual would contract cancer resulting from exposure to TACs continuously over a period of several years.

The BAAQMD and the California Office of Environmental Health Hazard Assessment (OEHHA) recommend that an exposure duration (duration of exposure to sensitive receptors) be based on the time an individual is exposed to TACs. In the case of construction, the duration of exposure corresponds to the duration of the construction time to be used to estimate individual cancer risk for the maximally exposed individual resident (MEIR).[8] Exposures to TACs can also result in both short-term (acute) or long-term (chronic) non-cancer health impacts. Such impacts could include illnesses related to reproductive effects, respiratory effects, eye sensitivity, immune effects, kidney effects, blood effects, central nervous system, birth defects, or other adverse environmental effects.

[8] Office of Environmental Health Hazard Assessment. Air Toxics Hot Spots Program-Risk Assessment Guidelines. Feb. 2015.

Thus, an HRA identifies the TACS that could affect public health, identifies the sources of the TAC emissions and quantifies the emissions, estimates where the emissions are transported by prevailing meteorological conditions, and determines the extent and number of individuals affected by the TACs.

## Emission Estimation

### *Estimation of Construction DPM Emissions*

Construction DPM emissions (as $PM_{2.5}$ exhaust) were estimated using the CalEEMod model as discussed in Section 3.2.4, Methodology for Construction and Operation Emissions, above. Construction was assumed to start in October 2018, and would last approximately 26 months. The construction DPM emissions were assumed to be distributed over the project area affected by the construction activities with a working schedule of 8 hours per day and 5 days per week.

## Estimation of Cancer Risks

The BAAQMD has developed a set of guidelines for estimating cancer risks that provide adjustment factors that emphasize the increased sensitivities and susceptibility of young children to exposures to TACs.[9] These adjustment factors include age-sensitivity weighting factors, age-specific daily breathing rates, and age-specific time-at-home factors. The recommend method for the estimation of cancer risk is shown in the equations below with the cancer risk adjustment factors provided in Table 3.2-7 for several types of sensitive/residential receptors (infant, child, and adult).

$$\text{Cancer Risk} = C_{DPM} \times \text{Inhalation Exposure Factor} \qquad \text{(EQ-1)}$$

Where:

Cancer Risk = Total individual excess cancer risk defined as the cancer risk a hypothetical individual faces if exposed to carcinogenic emissions from a particular source for specified exposure durations; this risk is defined as an excess risk because it is above and beyond the background cancer risk to the population; cancer risk is expressed in terms of risk per million exposed individuals.

$C_{DPM}$ = Period average DPM air concentration calculated from the air dispersion model in $\mu g/m^3$

Inhalation is the most important exposure pathway to impact human health from DPM and the inhalation exposure factor is defined as follows:

$$\text{Inhalation Exposure Factor} = CPF \times EF \times ED \times DBR \times AAF/AT \qquad \text{(EQ-2)}$$

Where:

CPF = Inhalation cancer potency factor for the TAC: 1.1 $(mg/kg\text{-}day)^{-1}$ for DPM
EF = Exposure frequency (days/year)
ED = Exposure duration (years of construction)

[9] BAAQMD. 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. Website: http://www.baaqmd.gov /~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en.

AAF = set of age-specific adjustment factors that include age sensitivity factors (ASF), daily breathing rates (DBR), and time at home factors (TAH)—see Table 3.2-7.
AT = Averaging time period over which exposure is averaged (days)

The OEHHA-recommended values for the various cancer risk parameters shown in EQ 2, above, are provided in Table 3.2-7.

**Table 3.2-7: Exposure Assumptions for Cancer Risk**

| Receptor Type | Exposure Frequency | | Exposure Duration During Construction (years) | Age Sensitivity Factors | Time at Home Factor (%) | Daily Breathing Rate[(1)] (l/kg-day) |
|---|---|---|---|---|---|---|
| | Hours/day | Days/year | | | | |
| **Sensitive/Residential—Infant** | | | | | | |
| 3rd Trimester | 24 | 350 | 0.25 | 10 | 85 | 361 |
| 0–2 years | 24 | 350 | 2 | 10 | 85 | 1,090 |
| **Sensitive Receptor—Child** | | | | | | |
| 3–16 years | 24 | 350 | 3 | 3 | 72 | 572 |
| **Sensitive Receptor—Adult** | | | | | | |
| > 16 to 30 years | 24 | 350 | 3 | 1 | 73 | 261 |

Notes:
(1) The daily breathing rates recommended by the BAAQMD for sensitive/residential receptors assume the 95th percentile breathing rates for all individuals less than 2 years of age and 80th percentile breathing rates for all older individuals.
(l/kg-day) = liters per kilogram body weight per day
Source: BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/workshops/2016/reg-2-5/hra-guidelines_clean_jan_2016-pdf.pdf?la=en

## Estimation of Non-Cancer Chronic Hazards

An evaluation of the potential non-cancer effects of chronic chemical exposures was also conducted. Adverse health effects are evaluated by comparing the annual receptor concentration of each chemical compound with the appropriate reference exposure limit (REL). Available RELs promulgated by the California Office of Environmental Health Hazards Assessment (OEHHA) were considered in the assessment.

Risk characterization for non-cancer health hazards from TACs is expressed as a hazard index (HI). The HI is a ratio of the predicted concentration of the project's emissions to a concentration considered acceptable to public health professionals, termed the REL.

To quantify non-carcinogenic impacts, the hazard index approach was used.

$$HI = Cann/REL \qquad \text{(EQ-3)}$$

Where:

HI = chronic hazard index
$C_{ann}$ = annual average concentration of TAC as derived from the air dispersion model ($\mu g/m^3$)
REL = reference exposure level above which a significant impact is assumed to occur ($\mu g/m^3$)

The hazard index assumes that chronic exposures to TACs adversely affect a specific organ or organ system (toxicological endpoint) of the body. For each discrete chemical exposure, target organs presented in regulatory guidance were used. To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity reference exposure level (REL). For compounds affecting the same toxicological endpoint, this ratio is summed. Where the total equals or exceeds 1, a health hazard is presumed to exist. For purposes of this assessment, the TAC of concern is DPM, for which the OEHHA has defined a REL for DPM of 5 $\mu g/m^3$. The principal toxicological endpoint assumed in this assessment was through inhalation.

## Cumulative HRA during Project Operation

The BAAQMD also recommends assessing the potential cumulative impacts from sources of TACs within 1,000 feet of a project. The BAAQMD provides three tools for use in screening potential sources of TACs. These tools are:

- **Surface Street Screening Tables.** BAAQMD pre-calculated potential cancer risks and $PM_{2.5}$ concentration increases for each county within their jurisdiction for roadways that meet BAAQMD's "major roadway" criteria of 10,000 vehicles or 1,000 trucks per day. Risks are assessed by roadway volume, roadway direction, and distance to sensitive receptors. There are no roadways located within 1,000 feet of the project boundary that generates more than 10,000 trips per day or more than 1,000 trucks per day.
- **Freeway Screening Analysis Tool**. BAAQMD prepared a Google Earth file that contains pre-estimated cancer risk, hazard index, and $PM_{2.5}$ concentration increases for highways within the Bay Area. Risks are provided by roadway link and are estimated based on elevation, direction, and distance to the sensitive receptor. There are no freeways located within 1,000 feet of the project boundary.
- **Stationary Source Risk and Hazard Screening Tool**. BAAQMD prepared a Google Earth file that contains the locations of all stationary sources within the Bay Area that have BAAQMD permits. For each emissions source, BAAQMD provides conservative cancer risk and $PM_{2.5}$ concentration increase values. There are no stationary sources located within 1,000 feet of the project site boundary.

## Air Dispersion Modeling

An air dispersion model is a mathematical formulation used to estimate the air quality impacts at specific locations (receptors) surrounding a source of emissions given the rate of emissions and prevailing meteorological conditions. The air dispersion model applied in this assessment was the EPA AERMOD (version 16216r) air dispersion model that is approved by the BAAQMD for air dispersion assessments. Specifically, the AERMOD model was used to estimate levels of air

emissions at sensitive receptor locations from the project's construction $PM_{2.5}$ exhaust and paved dust emissions. The use of the AERMOD model provides a refined methodology for estimating construction impacts by utilizing long-term, measured representative meteorological data for the project site and a representative construction schedule.

Terrain elevations were obtained for the project site using the AERMAP model, the AERMOD terrain data pre-processor. The rural dispersion option was used to describe the air dispersion in the local vicinity of the project. The air dispersion model assessment used meteorological data from Livermore Municipal Airport Monitoring Station, which is approximately 4.48 miles northeast of the project site.

### *Air Dispersion Modeling—Construction*

Receptors within the AERMOD model were placed at locations of existing residences surrounding the project. To evaluate the project's localized construction impacts, sensitive receptor height is ground level which results in the highest impacts at the receptor.

An area emission source was used to represent the project's on-site construction emissions. The construction area source represented the generation of on-site construction DPM emissions (as $PM_{2.5}$ exhaust) from the on-site construction equipment. The emissions from the on-site construction exhaust source were assumed to be emitted at a height of 5 meters above ground to account for the top of the equipment exhaust stack where the emissions are released to the atmosphere and the increase in the height of the emissions due to its heated exhaust.

The off-site construction vehicle emissions were represented in the AERMOD model as line volume sources with a release height of 3.1 meters for the DPM vehicles. All the construction truck trips were assumed to travel along Westbridge Lane and Happy Valley Road towards Interstate 680.

## 3.2.6 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to air quality are significant environmental effects, the following questions are analyzed and evaluated.

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?
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
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)?
d) Expose sensitive receptors to substantial pollutant concentrations?
e) Create objectionable odors affecting a substantial number of people?

While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to CEQA Guidelines Section 15064(b), the BAAQMD recommends that its quantitative and qualitative air pollution thresholds be used to determine the significance of project emissions. These thresholds are adopted for this assessment and are discussed under each impact section below.

## BAAQMD Thresholds of Significance

In June 2010, BAAQMD adopted thresholds of significance to assist in the review of projects under CEQA. These thresholds were designed to establish the level at which BAAQMD believed air pollution emissions would cause significant environmental impacts under CEQA and were posted on BAAQMD's website and included in the BAAQMD's current CEQA Guidelines (updated May 2017).[10]

CEQA requires the analysis of potential adverse effects of a project on the environment. Potential impacts of the environment on a project are legally not required to be analyzed or mitigated under CEQA but are evaluated in this assessment

### Table 3.2-8: BAAQMD Thresholds of Significance

| Pollutant | Construction Thresholds Average Daily Emissions | Operational Thresholds | |
|---|---|---|---|
| | | Average Daily Emissions | Annual Average Emissions |
| **Criteria Air Pollutants** | | | |
| VOC | 54 pounds/day | 54 pounds/day | 10 tons/year |
| $NO_X$ | 54 pounds/day | 54 pounds/day | 10 tons/year |
| $PM_{10}$ | 82 pounds/day | 82 pounds/day | 15 tons/year |
| $PM_{2.5}$ | 54 pounds/day | 54 pounds/day | 10 tons/year |
| CO | Not Applicable | 9.0 ppm (8-hour average) or 20.0 ppm (1-hour average) | |
| Fugitive Dust | Construction Dust Ordinance or other Best Management Practices | Not Applicable | |
| **Health Risks and Hazards for New Sources** | | | |
| Excess Cancer Risk | 10 per one million | 10 per one million | |
| Chronic or Acute Hazard Index | 1.0 | 1.0 | |
| Incremental annual average $PM_{2.5}$ | 0.3 $\mu g/m^3$ | 0.3 $\mu g/m^3$ | |

[10] Bay Area Air Quality Management District (BAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed September 22, 2017.

**Table 3.2-8 (cont.): BAAQMD Thresholds of Significance**

| Pollutant | Construction Thresholds Average Daily Emissions | Operational Thresholds | |
|---|---|---|---|
| | | Average Daily Emissions | Annual Average Emissions |
| **Health Risks and Hazards for Sensitive Receptors (Cumulative from All Sources within 1,000-Foot Zone of Influence) and Cumulative Thresholds for New Sources** | | | |
| Excess Cancer Risk | 100 per 1 million | | |
| Chronic Hazard Index | 10.0 | | |
| Annual Average $PM_{2.5}$ | 0.8 µg/m$^3$ | | |

Notes:
VOC = volatile organic compounds
$NO_X$ = nitrogen oxides
$PM_{10}$ = course particulate matter or particulates with an aerodynamic diameter of 10 µm or less
$PM_{2.5}$ = fine particulate matter or particulates with an aerodynamic diameter of 2.5 µm or less
Source: Bay Area Air Quality Management District (BAAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa /ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed September 22, 2017.

### Happy Valley Specific Plan FEIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to air quality and found that the project would have a potentially significant impact on air quality without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR that are applicable to the proposed project, and, as shown, Mitigation Measures D1-D4 are applicable. Mitigation Measures D1–D3 require the implementation of dust inhibiting practices during grading and construction, and Mitigation Measure D4 prohibits excavation and grading when winds exceed 25 miles per hour. The mitigation measures applied to the HVSP for air quality will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what was envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the air quality impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation as envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more serve environmental impacts than those analyzed in the HVSP FEIR in relation to air quality. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures where needed.

## 3.2.7 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the proposed project and provides mitigation measures where appropriate.

## Consistency with Air Quality Management Plan

**Impact AIR-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.**

### *Impact Analysis*

The Air Basin is designated non-attainment for state standards for 1-hour and 8-hour ozone, 24-hour respirable particulate matter ($PM_{10}$), annual $PM_{10}$, and annual fine particulate matter ($PM_{2.5}$).[11] The Air Basin is also non-attainment for the federal ozone and $PM_{2.5}$ federal standards. A project would be judged to conflict with or obstruct implementation of the regional AQP if it would result in substantial new regional emissions not foreseen in the air quality management planning process. Regional emissions forecasts in the air quality management plan rely on population and employment forecasts based on City and County General Plans.

To address regional air quality standards, the BAAQMD has adopted several air quality policies and plans, and in April 2017, BAAQMD adopted its 2017 Clean Air Plan (2017 CAP),[12] which serves as the regional AQP for the Air Basin for attaining federal ambient air quality standards. The primary goals of the 2017 CAP are to protect public health and protect the climate. The 2017 CAP acknowledges that the BAAQMD's two stated goals of protection are closely related. As such, the 2017 CAP identifies a wide range of control measures intended to decrease both criteria pollutants and greenhouse gases. In September 2010, BAAQMD adopted its final Bay Area 2010 Clean Air Plan (2010 CAP),[13] which became the most recent ozone plan for the Air Basin. The 2010 CAP identifies how the Air Basin would achieve compliance with the state 1-hour air quality standard for ozone, and how the region will reduce ozone from transporting to other basins downwind of the Air Basin. The 2017 CAP updates the BAAQMD's 2010 CAP, pursuant to air quality planning requirements defined in the California Health & Safety Code.

The 2017 CAP also accounts for projections of population growth provided by Association of Bay Area Governments and vehicle miles traveled provided by the Metropolitan Transportation Commission, and identifies strategies to bring regional emissions into compliance with federal and State air quality standards. A project would be judged to conflict with or obstruct implementation of the 2017 CAP if it would result in substantial new regional emissions not foreseen in the air quality planning process.

The BAAQMD does not provide a numerical threshold of significance for project-level consistency analysis. Therefore, the following criteria will be used for determining a project's consistency with the AQP:

- **Criterion 1:** Does the project support the primary goals of the AQP?
- **Criterion 2:** Does the project include applicable control measures from the AQP?
- **Criterion 3:** Does the project disrupt or hinder implementation of any AQP control measures?

[11] BAAQMD. 2017. Air Quality Standards and Attainment Status. January. Website: http://www.baaqmd.gov/research-and-data/air-quality-standards-and-attainment-status. Accessed March 30, 2018.

[12] BAAQMD. 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed May 24, 2017.

[13] Bay Area Air Quality Management District (BAAQMD). 2010. 2010 Multi Pollutant Clean Air Plan. Website: http://www.baaqmd.gov/plans-and-climate/air-quality-plans/current-plans. Accessed May 24, 2017.

*Criterion 1: Support Primary Goals of AQP*

The primary goals of the 2017 CAP, the current AQP to date, are to:

- Attain air quality standards;
- Reduce population exposure to unhealthy air and protecting public health in the Bay Area; and
- Reduce greenhouse gas emissions and protect the climate.

**Consistency with Assumptions in AQP**

The primary way of determining whether a project is consistent with the AQP's assumptions is to determine if the General Plan is consistent with the growth assumptions used in the AQPs for the Air Basin, and if the project is consistent with the applicable General Plan. As required by California law, city and county general plans contain a Land Use Element that details the types and quantities of land uses that the city or county estimates will be needed for future growth, and designates locations for land uses to regulate growth. Existing and future pollutant emissions computed in the AQP are based on land uses from area general plans. AQPs provide the amount of emission reductions required to reach attainment of the air standards based on the projected growth in emissions, and include control measures required to achieve those reductions by the deadlines mandated by the Clean Air Act.

As discussed in Section 3.9, Land Use and Planning, the proposed project is generally consistent with the applicable goals and policies of the City of Pleasanton General Plan and the Happy Valley Specific Plan (HVSP). The 2005–2025 General Plan designates the project site as Low Density Residential, Medium Density Residential, and Open Space—Public Health and Safety. The HVSP designates the project site as PUD—Medium Density Residential (PUD-MDR); PUD—Semi-Rural Density Residential (PUD-SRDR); and PUD—Agriculture/Open Space (PUD-AG/OS). The HVSP contemplated the development of 183 additional homes over the then-existing 111 housing units in the HVSP area. The project applicant is proposing to develop 39 homes on approximately 31 acres of the Spotorno Flat Area of the HVSP, an increase of 17 units over the existing allowable units for the Spotorno Flat Area. However, as discussed in Section 3.9, Land Use and Planning implementation of the proposed project, also includes redesignation of the PUD-MDR designated portion of the Spotorno Upper Valley Area to Open Space/Agriculture in conformance with Measure PP/QQ, resulting in a decrease of 75 units in the Spotorno Upper Valley Area (MDR). Overall, the proposed project would result in a Specific Plan buildout of approximately 58 fewer homes than initially contemplated by the HVSP. As such, the proposed project would not result in a substantial unplanned increase in population, employment, or regional growth in vehicle miles traveled. Therefore, emissions related to development of the project site would have been included in growth forecasts for the current AQP as Low Density Residential, Medium Density Residential, and Open Space—Public Health and Safety, and implementation of the project would not result in substantial new regional emissions not foreseen in the air quality management planning process.

**Contribution to Air Quality Violations**

A measure for determining if the project is consistent with the air quality plans is ensuring the project would not result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards or the

interim emission reductions specified in the air quality plans. This measure is determined by evaluating the project in view of the regional and localized thresholds identified by the District for Regional and Local Air Pollutants, which are used in this SEIR to evaluate Impacts AIR-2 through AIR-3. As discussed under Impacts AIR-2 and AIR-3, the project would not create a regional or localized violation of state or federal air quality standards or significantly contribute to cumulative non-attainment pollutant violations after incorporation of Mitigation Measure (MM) AIR-2, required to ensure implementation and enforcement of dust control measures. As discussed under Impact AIR-4, below, the project would not expose sensitive receptors to substantial pollutant concentrations after incorporation of mitigation measures. Further, as discussed under Impact AIR-5, the project would not create objectionable odors affecting a substantial number of people. Therefore, the project is consistent with Criterion 1 with incorporation of mitigation.

*Criterion 2: Include Applicable AQP Control Measures*

The 2017 CAP contains 85 control measures aimed at reducing air pollutants and GHGs at the local, regional, and global levels. Along with the traditional stationary, area, mobile source, and transportation control measures, the 2017 CAP contains a number of control measures designed to protect the climate and promote mixed use, compact development to reduce vehicle emissions and human exposure to pollutants from stationary and mobile sources.[14] The 2017 CAP also includes an account of the implementation status of control measures identified in the 2010 CAP.

None of the stationary source control measures contained in the 2017 CAP are directly applicable to the project, which is a proposed residential development that would not contain any stationary sources. In addition, none of the mobile source measures or land use and local impact measures contained in the 2017 CAP directly apply to the project. The project would support the overall goals of the CAP. Implementation of the project would provide housing near similar, existing land uses. Transit service in the area is provided by Wheels, Pleasanton Paratransit, The County Connection, Bay Area Rapid Transit (BART), and Altamont Commuter Express (ACE). Continuous pedestrian connections are not provided to transit stops from the project site, and the closest transit stop is over 1.5 miles from the project site; therefore, it is expected that any future residents who would use transit would drive to transit stations.

There are currently Class II bicycle lanes along portions of Sunol Boulevard and Sycamore Creek Way, the closest segment of which is approximately 0.4 mile from the project site. Class II facilities on Sunol Boulevard are only provided in the southbound direction from Sycamore Road to just west of Arlington Drive, where the lane terminates.

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. As noted above, sidewalks are limited on most of the existing roadway networks in the study area. Sunol Boulevard provides sidewalks on the east side of the roadway; however, this sidewalk stops at the I-680 Northbound Ramp. At the intersections of Sunol Boulevard with Sycamore Road and Arlington Drive, there are crosswalks with pedestrian call buttons. Unpaved trails are also located in the area,

[14] BAAQMD 2017. Final 2017 Clean Air Plan. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en. Accessed May 24, 2017.

including the Callippe Preserve Trail, which has a trail head on Sanctuary Lane at Happy Valley Road and on Clubhouse Drive, northeast of Westbridge Lane.

The 2010 CAP contained Energy and Climate measures that were carried forward in the 2017 CAP. Relative to the Energy and Climate measures contained in the 2017 CAP, the project would be consistent with all applicable measures, including the following:

- **Energy Efficiency:** The project applicant would be required to conform to the energy efficiency requirements of the California Building Standards Code, also known as Title 24, as applied to residential land uses. Specifically, the project must implement the requirements of the most recent Building Energy Efficiency Standards, which is the current version of Title 24. The 2016 Building Energy Efficiency Standards (which are updated on an approximately 3-year cycle) went into effect on January 1, 2017, which continue to improve upon the 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. For each year of construction, in both newly constructed buildings and alterations to existing buildings, the 2013 Standards (for residential and nonresidential buildings) were expected to reduce the growth in electricity use by 555.5 gigawatt-hours per year and to reduce the growth in peak electrical demand by 148.4 megawatts on a statewide basis. The 2013 Standards were also expected to reduce the growth in natural gas use by 7.04 million therms per year beyond the prior 2008 Standards. Overall, the 2013 Standards used 25 percent less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 Standards. For comparison purposes, single-family homes built to the new 2016 standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards. In 30 years, California will have saved enough energy to power 2.2 million homes, reducing the need to build 12 additional power plants.
- **Renewable Energy.** Pacific Gas and Electric Company (PG&E) would provide electricity and natural gas service to the project site. PG&E facilities include nuclear, natural gas, and hydroelectric facilities. PG&E's 2012 power mix consisted of nuclear generation (21.0 percent), large hydroelectric facilities (11.0 percent) and renewable resources (19.0 percent), such as wind, geothermal, biomass, and small hydro. The remaining portion came from natural gas (27.0 percent), and unspecified sources (21.0 percent).
- **Urban Heat Island Mitigation and Shade Tree Planting.** The project would incorporate landscaping, including shade trees, throughout the developed portion of the project site. In addition, approximately 80 acres of the 154-acre project site would be dedicated as permanent open space.

In summary, the project would include applicable control measures from the 2017 CAP and is therefore consistent with Criterion 2.

*Criterion 3: Disrupt or Hinder Implementation of any AQP Control Measures*

The project would not preclude extension of a transit line or bike path, propose excessive parking beyond parking requirements, or otherwise create an impediment or disruption to implementation of any AQP control measures. As discussed above, the project would incorporate several Energy and

Climate AQP control measures as project design features. Because the project would not disrupt or hinder implementation of any AQP control measures, the project is therefore consistent with Criterion 3.

*Conclusion*

The project would be consistent with Criteria 1, 2, and 3; therefore, the project would not conflict with the implementation of the AQP. The project would be required to implement the mitigation measures identified under Impact AIR-2 and Impact AIR-4 to be consistent with Criterion 1. The impact would be less than significant after incorporation of mitigation.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement MM AIR-2 and MM AIR-4.

### *Level of Significance After Mitigation*

Less than significant impact.

## Potential for Air Quality Standard Violation

| | |
|---|---|
| **Impact AIR-2:** | **The project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation.** |

### *Impact Analysis*

This impact relates to localized criteria pollutant impacts. Potential localized impacts would consist of exceedances of state or federal standards for $PM_{2.5}$, $PM_{10}$, CO, $SO_2$, and $NO_2$. Particulate matter emissions (both $PM_{10}$ and $PM_{2.5}$) are of concern during project construction because of the potential to emit fugitive dust during earth-disturbing activities. CO emissions are of concern during project operation because operational CO hotspots are related to increases in on-road vehicle congestion. In addition, emissions of VOC are important because of their participation in the formation of ozone. VOC emissions result from motor vehicles, and hydrocarbon evaporation from solvent use and painting. Finally, $NO_X$ emissions are important not only for their potential health impacts but also their participation as an ingredient in the formation of ozone. Regional construction and operational impacts are not addressed in this section, but are addressed under Impact AIR-3.

*Short-term Construction Impacts*

**Construction Fugitive Dust**

Project construction would require general site clearing and grading/earthwork activities during construction. Emissions from construction activities are generally short-term in duration, but may still cause adverse air quality impacts. The project would generate emissions from construction equipment exhaust, worker travel, and fugitive dust as $PM_{10}$ and $PM_{2.5}$. The project's potential impacts related to equipment exhaust are evaluated separately under Impact AIR-3, below.

BAAQMD does not recommend a numerical threshold for fugitive dust particulate matter emissions. Instead, BAAQMD bases the determination of significance for fugitive dust on the inclusion of Best

Management Practices (BMPs) to control fugitive dust. If all appropriate BMP emissions control measures are implemented for a project as recommended by BAAQMD, then fugitive dust emissions during construction are not considered significant.

The project does not currently include any dust control measures, resulting in the potential for a significant impact. Therefore, the fugitive dust control measures identified in the BAAQMD's Guidelines must be included to reduce localized dust impacts to less than significant. MM AIR-2 requires the application of BMPs for fugitive dust control. Implementation of MM AIR-2 ensures implementation and enforcement of the BMPs and thereby reduces the project's construction-generated fugitive dust impact to less than significant. Therefore, with mitigation, short-term construction impacts associated with violating an air quality standard or contributing substantially to an existing or projected air quality violation would be less than significant.

*Long-term Operational Impacts*

**Operational CO Hotspot**

Localized high levels of CO (CO hotspot) are associated with traffic congestion and idling or slow-moving vehicles. The BAAQMD recommends a screening analysis to determine if a project has the potential to contribute to a CO hotspot. The screening criteria identify when site-specific CO dispersion modeling is not necessary. The project would result in a less than significant impact to air quality for local CO if one of the following screening criteria are met:

- The project is consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans; or
- The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour; or
- The project traffic would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

The Alameda County Transportation Commission (Alameda CTC) serves as the Congestion Management Agency (CMA) for Alameda County. As indicated in Section 3.12, Transportation, the I-680/Sunol Boulevard interchange is a Congestion Management Plan facility. The project would not conflict with an applicable congestion management program after the implementation of MM TRANS-3.

The Spotorno Property Transportation Assessment prepared by Fehr & Peers and included as Appendix I to the Draft SEIR identified peak-hour traffic volumes for eight intersections affected by the project. As identified in the Transportation Assessment (Fehr & Peers 2018), the maximum peak-hour intersection volume would occur at the Sunol Boulevard/Sycamore Road intersection in the Cumulative with Project without Bypass Bass Road Peak Hour scenario during the AM peak hour. The estimated cumulative traffic volume at the Sunol Boulevard/Sycamore Road intersection is 3,447 AM peak-hour trips. This level of peak-hour trips is substantially less than the BAAQMD's second and

third screening criteria of 44,000 vehicles per hour and 24,000 vehicles per hour respectively. The project would not result in an increase of traffic volumes at affected intersections to more than 44,000 vehicles per hour and would not increase traffic volumes at affected intersections to more than 24,000 where vertical or horizontal mixing is substantially limited thus satisfying the last two criteria.

The project meets at least one of the three screening criteria; therefore, the project would not result in a significant impact to air quality for local CO emissions.

### *Level of Significance Before Mitigation*

*Short-term Impacts*

Potentially significant impact.

*Long-term Impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term Impacts*

**MM AIR-2** During construction, the following air pollution control measures shall be implemented:

- Exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, or more as needed.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered
- All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- All vehicle speeds on unpaved roads and surfaces shall be limited to 15 miles per hour.
- All roadways, driveways, and sidewalks shall be paved as soon as possible.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.
- All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- A publicly visible sign shall be posted with the telephone number and person to contact both at the City of Pleasanton and at the office of the General Contractor regarding dust complaints. This person shall respond and take corrective action within 2 business days of a complaint or issue notification. The BAAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

*Long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term impacts*

Less than significant impact.

*Long-term impacts*

Less than significant impact.

## Cumulative Criteria Pollutant Impacts

| | |
|---|---|
| **Impact AIR-3:** | **The project would not result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).** |

### *Impact Analysis*

This impact is related to regional air quality emissions and their impacts. Non-attainment pollutants of concern for this impact are ozone, $PM_{10}$ and $PM_{2.5}$. Note that ozone is not directly emitted into the atmosphere but is formed in the atmosphere involving atmospheric reactions of $NO_X$ and VOC as ozone precursors. Therefore, compliance with significance thresholds also applies to these pollutants as well. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified regional significance thresholds, its emissions would be cumulatively considerable and result in significant adverse air quality impacts to the region's existing air quality conditions. Project construction and operational impacts are assessed separately below.

*Construction Emissions*

Off-road construction equipment is a large source of $NO_X$ and DPM in the Air Basin. $NO_X$ is an ozone precursor pollutant that contributes to regional ozone formation. DPM contributes to elevated $PM_{10}$ and $PM_{2.5}$ concentrations and is a TAC. Construction activities associated with development activities contemplated by the project would include site preparation, grading, paving, building construction, and architectural coatings. Generally, the most substantial air pollutant emissions would be dust generated from site preparation and grading. If uncontrolled, these emissions could lead to both health and nuisance impacts. Construction activities would also temporarily create emissions of equipment exhaust and other air contaminants.

**Construction Fugitive Dust**

$PM_{10}$ is of concern during construction because of the potential to emit fugitive dust during earth-disturbing activities (construction fugitive dust). During construction (grading), fugitive dust ($PM_{10}$) would be generated from site grading and other earth-moving activities. The majority of this fugitive dust would remain localized and would be deposited near the project site.

As discussed in Impact AIR-2 above, the project's construction-generated fugitive dust impact would be reduced to less than significant after incorporation of MM AIR-2.

**Construction Criteria Air Pollutants Emissions**

The project would be constructed in a single phase. For the purpose of a conservative analysis, it was assumed that construction would begin in October 2018 and be completed by December 2020. The construction schedule used in the analysis represents a reasonably "worst-case" analysis scenario, since emission factors for construction equipment are expected to decrease as the starting year of construction increases into the future due to improvements in technology and more stringent regulatory requirements. Therefore, estimated emissions from construction of the project would likely decrease if the construction schedule moved to later years. The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required by the CEQA Guidelines. The construction emissions modeling parameters and assumptions are summarized in Section 3.2.4, Methodology for Construction and Operation Emissions and are provided in Appendix B.

Table 3.2-9 summarizes the unmitigated construction-generated emissions in annual tons, while Table 3.2-10 provides the unmitigated average daily emissions rates per construction year for the project. Construction emissions are assessed against the applicable BAAQMD threshold in Table 3.2-10.

### Table 3.2-9: Unmitigated Construction Criteria Air Pollutants Emissions (Annual Tons)

| Construction Phase | Tons/Year | | | |
|---|---|---|---|---|
| | VOC | $NO_X$ | $PM_{10}$ (Exhaust) | $PM_{2.5}$ (Exhaust) |
| **2018** | | | | |
| Site Preparation | 0.05 | 0.48 | 0.03 | 0.02 |
| Grading | 0.12 | 1.34 | 0.06 | 0.05 |
| Building Construction (2018) | 0.00 | 0.01 | <0.01 | <0.01 |
| *Total 2018 Construction Emissions* | *0.16* | *1.84* | *0.09* | *0.08* |
| **2019** | | | | |
| Building Construction (2019) | 0.36 | 3.25 | 0.17 | 0.16 |
| *Total 2019 Construction Emissions* | *0.36* | *3.25* | *0.17* | *0.16* |
| **2020** | | | | |
| Building Construction (2020) | 0.22 | 2.02 | 0.10 | 0.10 |
| Paving | 0.03 | 0.25 | 0.01 | 0.01 |
| Architectural Coating | 1.06 | 0.03 | <0.01 | <0.01 |
| *Total 2020 Construction Emissions* | *1.31* | *2.29* | *0.12* | *0.11* |
| **Total Construction Emissions** | **1.83** | **7.38** | **0.37** | **0.35** |

Notes:
VOC = volatile organic compounds ;$NO_X$ = oxides of nitrogen
$PM_{10}$ = particulate matter 10 microns in diameter
$PM_{2.5}$ = particulate matter 2.5 microns in diameter
< = less than
Calculations use unrounded numbers presented in the CalEEMod output.
Source: CalEEMod Output (see Appendix B).

## Table 3.2-10: Unmitigated Construction Criteria Air Pollutants Emissions (Average Daily Rate)

| Parameter | Air Pollutants | | | |
|---|---|---|---|---|
| | VOC | $NO_X$ | $PM_{10}$ (Exhaust) | $PM_{2.5}$ (Exhaust) |
| Total Emissions (total tons) | 1.83 | 7.38 | 0.37 | 0.35 |
| Total Emissions (total lbs) | 3,666 | 14,756 | 748 | 700 |
| Average Daily Emissions (lbs/day)[2] | 6.38 | 25.66 | 1.30 | 1.22 |
| Significance Threshold (lbs/day) | **54** | **54** | **82** | **54** |
| Exceeds Significance Threshold? | No | No | No | No |

Notes:
[1] Calculated by dividing the total number of pounds by the total 575 working days of construction for the duration of construction (2018-2020).
Calculations use unrounded totals.
VOC = volatile organic compounds; $NO_X$ = oxides of nitrogen
$PM_{10}$ = particulate matter 10 microns in diameter
$PM_{2.5}$ = particulate matter 2.5 microns in diameter
lbs = pounds
Source of thresholds: BAAQMD 2017
Source of emissions: CalEEMod Output (see Appendix B).

As shown in Table 3.2-9, construction emissions are well below the recommended thresholds of significance.

*Operational Emissions*

As previously discussed, the pollutants of concern include VOC, $NO_X$, $PM_{10}$, and $PM_{2.5}$. Project operational emissions were estimated using the CalEEMod model version 2016.3.2. The trip generation rates are from the Spotorno Property Transportation Assessment prepared for the project by Fehr & Peers (Appendix I). In order to provide a conservative estimate, 2020 was used as the operational year when all units are expected to be completed and occupied. Assumptions and parameters are discussed in Section 3.2.4, Methodology and are provided in Appendix B. The daily operational emissions were modeled for summer and winter seasons. The estimated highest daily operational results for each pollutant and season are presented in Table 3.2-11 and compared with the BAAQMD's maximum daily rate operational threshold. The unmitigated annual emissions from project operations are presented Table 3.2-12 and compared the BAAQMD's annual operational threshold.

## Table 3.2-11: Unmitigated Daily Operational Criteria Air Pollutants Emissions (Maximum Daily Rate)

| Emissions Source | Pounds per Day | | | |
|---|---|---|---|---|
| | VOC | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Area | 1.48 | 0.14 | 0.45 | 0.45 |
| Energy | 0.01 | 0.06 | <0.01 | <0.01 |

## Table 3.2-11 (cont.): Unmitigated Daily Operational Criteria Air Pollutants Emissions (Maximum Daily Rate)

| Emissions Source | Pounds per Day | | | |
|---|---|---|---|---|
| | VOC | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Mobile | 0.29 | 0.83 | 0.85 | 0.23 |
| ***Total Operational Emissions*** | ***1.78*** | ***1.04*** | ***1.30*** | ***0.69*** |
| **Thresholds of Significance** | **54** | **54** | **82** | **54** |
| Exceeds Significance Threshold? | No | No | No | No |

Notes:
VOC = volatile organic compounds; $NO_X$ = nitrous oxides
$PM_{10}$ = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
< = less than
The highest emissions occur during the summer modeling run for VOC. The highest emissions occur during the winter modeling run for $NO_X$, $PM_{10}$, and $PM_{2.5}$.
Calculations use unrounded totals.
Source of Emissions: CalEEMod Output (see Appendix B)
Source of Thresholds: BAAQMD 2017

## Table 3.2-12: Unmitigated Annual Operational Criteria Air Pollutants (Annual Rate)

| Emissions Source | Tons per Year | | | |
|---|---|---|---|---|
| | VOC | $NO_X$ | $PM_{10}$ | $PM_{2.5}$ |
| Area | 0.69 | <0.01 | <0.01 | <0.01 |
| Energy | 0.01 | 0.05 | <0.01 | <0.01 |
| Mobile | 0.12 | 0.75 | 0.32 | 0.09 |
| ***Total Operational Emissions*** | ***0.81*** | ***0.81*** | ***0.33*** | ***0.10*** |
| **Thresholds of Significance** | **10** | **10** | **15** | **10** |
| Exceeds Significance Threshold? | No | No | No | No |

Notes:
VOC = volatile organic compounds; $NO_X$ = nitrous oxides
$PM_{10}$ = particulate matter 10 microns or less in diameter
$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter
< = less than
Source of Emissions: CalEEMod Output (see Appendix B)
Source of Thresholds: BAAQMD 2017

As shown in Table 3.2-11 and Table 3.2-12 the project would not result in operational-related air pollutants or precursors that would exceed BAAQMD's thresholds of significance, indicating that ongoing project operations would not be considered to have the potential to generate a significant

quantity of air pollutants. Therefore, long-term operational impacts associated with criteria pollutant emissions would be less than significant.

*Conclusion*

As shown in Table 3.2-9, construction emissions associated with the project are below the BAAQMD's thresholds of significance and, therefore, are less than significant on a project basis. As indicated in Table 3.2-11 and Table 3.2-12, total emissions from operation of the project would not exceed BAAQMD's daily or annual thresholds. The thresholds of significance represent the allowable amount of emissions each project can generate without generating a cumulatively considerable contribution to regional air quality impacts. Therefore, emissions associated with the project would not result in a cumulatively considerable net increase of any criteria pollutant during either construction or operations. The impact would be less than significant after incorporation of MM AIR-2.

### *Level of Significance Before Mitigation*

*Short-term Impacts*

Potentially significant impact.

*Long-term Impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term impacts*

Implement MM AIR-2.

*Long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term impacts*

Less than significant impact.

*Long-term impacts*

Less than significant impact.

## Sensitive Receptors

| | |
|---|---|
| **Impact AIR-4:** | **The project would not expose sensitive receptors to substantial pollutant concentrations.** |

### *Impact Analysis*

This impact addresses whether the project would expose sensitive receptors to asbestos, construction-generated fugitive dust ($PM_{10}$ and $PM_{2.5}$), construction-generated DPM, operational-related TACs, or operational CO hotspots. The modeling assumption and methodology for the Health Risk Assessment of DPM emissions are provided in Appendix B.

The BAAQMD considers a sensitive receptor any facility or land use that includes members of the population who are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. If a project is likely to be a place where people live, play, or convalesce, it should be considered a receptor. It should also be considered a receptor if sensitive individuals are likely to spend a significant amount of time there. Examples of receptors include residences, schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, and medical facilities. As a proposed residential land use, the project itself is a sensitive receptor. The closest non-project sensitive receptors are residences located adjacent to the project site to the north, west, southwest, south, and southeast. As discussed below, the maximum impacted off-site sensitive receptor (MIR) was determined to be an existing residence located approximately 68 feet south of the site at 2315 Westbridge Lane.

Potential air quality impacts arise when sources of air pollutants and sensitive receptors are located near one another. Localized impacts to sensitive receptors generally occur in one of two ways:

1. A (new) source of air pollutants is located close to existing sensitive receptors;
2. A (new) sensitive receptor is located near an existing source of air pollutants.

To address this impact, the quantitative thresholds provided in the 2017 BAAQMD Guidelines have been utilized for this assessment.

*Construction Localized Fugitive Dust*

Activities associated with site preparation and construction would generate short-term emissions of fugitive dust resulting in increased dust fall and locally elevated levels of $PM_{10}$ and $PM_{2.5}$ downwind of construction activity. Construction dust has the potential for creating a nuisance at nearby properties. However, as addressed in Impact AIR-2, MM AIR-2 is included to ensure that the current BMPs would be implemented to reduce fugitive dust emissions from construction activities to less than significant. Implementation of MM AIR-2 would ensure impacts related to localized fugitive dust would remain less than significant.

*Construction Generation of Toxic Air Contaminants*

**Estimation of Project-Level Construction DPM Emissions**

The DPM construction emissions (as $PM_{2.5}$ exhaust emissions) were estimated using the CalEEMod model, version 2016.3.2. Table 3.2-13 summarizes annual construction $PM_{2.5}$ emissions without and with mitigation measures.

**Table 3.2-13: Project DPM (as $PM_{2.5}$ Exhaust) Construction Emissions**

| Phases | On-site DPM (grams/m$^2$-sec) | Off-site DPM From SR-12 West to project (grams/sec) |
|---|---|---|
| **Annual Construction Emissions (No Mitigation)** | | |
| 2018 | 2.94E-07 | 1.08E-06 |
| 2019 | 1.48E-07 | 2.85E-05 |
| 2020 | 1.04E-07 | 1.43E-05 |

## Table 3.2-13: Project DPM (as $PM_{2.5}$ Exhaust) Construction Emissions

| Phases | On-site DPM (grams/$m^2$-sec) | Off-site DPM From SR-12 West to project (grams/sec) |
|---|---|---|
| **Annual Construction Emissions (Tier III Mitigation)** | | |
| 2018 | 1.46E-07 | 1.08E-06 |
| 2019 | 1.01E-07 | 2.85E-05 |
| 2020 | 8.86E-08 | 1.43E-05 |
| Source: CalEEMod and FirstCarbon Solutions; see Appendix B | | |

**Estimates of Health Risks and Hazards from Project Construction**

The estimated health and hazard impacts at the maximum impacted off-site sensitive receptor from the project's construction emissions are provided in Table 3.2-14. The maximum impacted off-site sensitive receptor (MIR) was found at an existing residence located approximately 68 feet south of the site at 2315 Westbridge Lane.

## Table 3.2-14: Estimated Health Risks and Hazards During Construction—Unmitigated

| Health Impact Metric | Cancer Risk (risk per million) | Chronic Non-Cancer Hazard Index[(2)] | Annual $PM_{2.5}$ Concentration ($\mu g/m^3$) |
|---|---|---|---|
| **Risks and Hazards at the Maximum Impacted Off-site Sensitive Receptor (MIR):** [(1)] | | | |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Infants | **16.5** | 0.01 | 0.1 |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Child | 2.5 | 0.01 | 0.1 |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Adult | 0.4 | 0.01 | 0.1 |
| BAAQMD Significance Threshold | 10.0 | 1.0 | 0.3 |
| Exceeds Individual Source Threshold? | **Yes (Infants)** | No | No |

Notes:
1 Maximum impacted sensitive receptor is a residence located 2315 Westbridge Lane, which is 68 feet south of the project site.
2 Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 $\mu g/m^3$.
Source: CalEEMod and FirstCarbon Solutions; see Appendix B

As shown in Table 3.2-14, the cancer risks for infants at the MIR would exceed the BAAQMD's recommended threshold of significance for cancer risk. Therefore, mitigation is required to reduce potential impacts to nearby sensitive receptors from project construction.

MM AIR-4 would require all off-road construction equipment in excess of 50 horsepower used on-site by the developer or contractors be equipped with engines meeting the EPA Tier III off-road engine emission standards. This would reduce cancer risks and hazards associated with construction emissions. Table 3.2-15 summarizes the project's estimated cancer risks and hazard impacts at the MIR from the project's construction emissions with the application of Tier III mitigation.

### Table 3.2-15: Estimated Health Risks and Hazards During Construction—Tier III Mitigation

| Health Impact Metric | Cancer Risk (risk per million) | Chronic Non-Cancer Hazard Index[(2)] | Annual $PM_{2.5}$ Concentration ($\mu g/m^3$) |
|---|---|---|---|
| **Risks and Hazards at the Maximum Impacted Off-site Sensitive Receptor (MIR):[(1)]** | | | |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Infants | 9.6 | 0.01 | 0.04 |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Child | 1.6 | 0.01 | 0.04 |
| Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Adult | 0.2 | 0.01 | 0.04 |
| BAAQMD Significance Threshold | 10.0 | 1.0 | 0.3 |
| Exceeds Individual Source Threshold? | No | No | No |

Notes:
1 Maximum impacted sensitive receptor is a resident located 2315 Westbridge Lane, which is 68 feet south of the project site.
2 Chronic non-cancer hazard index was estimated by dividing the annual DPM concentration (as $PM_{2.5}$ exhaust) by the REL of 5 $\mu g/m^3$.
Source: CalEEMod and FirstCarbon Solutions; see Appendix B

As noted in Table 3.2-15, the project's construction emissions would not exceed the BAAQMD's significance threshold at the MIR after implementation of MM AIR-4. Therefore, with implementation of Tier III mitigation, the project's construction emissions would not result in significant health impacts to nearby sensitive receptors.

*Estimates of Health Risks and Hazards from Project Operation*

The proposed project involves the construction and development of 39 single-family homes within an approximately 31-acre area and would permanently preserve approximately 80 acres as open space. The portion of the project to be developed is designed for residential uses, and there would be no on-site TAC sources during operation. Unlike warehouses or distribution centers, the daily vehicle trips generated by the project would be generated by passenger vehicles. Because nearly all passenger vehicles are gasoline-combusted, the project would not generate significant amount of DPM emissions during operation. Therefore, the project would not result in significant health impacts to nearby sensitive receptors during operation.

*Cumulative Health Risks*

The cumulative impact assessment quantified the cumulative impacts from existing TAC emission sources located within 1,000 feet of the project site in addition to the maximum TAC emissions from the project. As discussed in Section 3.2.5, there are no existing TAC sources (local roadway, stationary sources and freeways) located within 1,000 feet of the project site boundary. In addition, the project's construction and operational-related health risk impacts would not exceed BAAQMD's project-level significance of thresholds. Therefore, the cumulative health impacts would not exceed the BAAMQD's recommended cumulative health significance thresholds. Impacts would be less than significant.

*Asbestos*

Structures to be demolished sometimes contain asbestos-containing materials; however, the project does not propose demolition of existing buildings. Therefore, construction of the project would not expose nearby sensitive receptors to asbestos through demolition of existing buildings.

The Department of Conservation, Division of Mines and Geology (DMG) published a guide for generally identifying areas that are likely to contain naturally occurring asbestos (NOA). The associated DMG map indicates that there are several locations within Alameda County that are likely to contain NOA; however, the closest of these sites is located greater than 5 miles from the project site.[15] Considering this information, the project would not expose nearby sensitive receptors or future residents to substantial amounts of asbestos and impacts relating to exposing sensitive receptors to asbestos would be less than significant.

*Operational CO Hotspot*

As addressed in Impact AIR-2, the project would not create a CO hotspot and would result in a less than significant impact for to air quality for local CO.

### *Level of Significance Before Mitigation*

*Short-term Impacts*

Potentially significant impact.

*Long-term Impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term impacts*

Implement MM AIR-2 and the following:

**MM AIR-4** The developer or project applicant shall ensure all off-road construction equipment in excess of 50 horsepower used on-site by the developer or contractors is equipped with engines meeting the EPA Tier III off-road engine emission standards. The construction contractor shall maintain a log of equipment use at the construction site with make, model, serial number, and certification level of each piece of construction equipment that will be available for review by the City's building inspection staff.

[15] Department of Conservation, Division of Mines and Geology. 2000. A General Location Guide for Ultramafic Rocks in California—Areas More likely to Contain Naturally Occurring Asbestos. August. Website: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ofr/ofr_2000-019.pdf. Accessed March 30, 2018.

*Long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term impacts*

Less than significant impact.

*Long-term impacts*

Less than significant impact.

## Objectionable Odors

**Impact AIR-5: The project would not create objectionable odors affecting a substantial number of people.**

### *Impact Analysis*

Odors can cause a variety of responses. The impact of an odor often results from interacting factors such as frequency (how often), intensity (strength), duration (time), offensiveness (unpleasantness), location, and sensory perception. Two circumstances have the potential to cause odor impacts:

1) A source of odors is proposed to be located near existing or planned receptors; or
2) A receptor land use is proposed near an existing or planned source of odor.

The BAAQMD's CEQA Air Quality Guidelines provides suggested screening distances for a variety of odor-generating land uses and operations, as shown in Table 3.2-16, that are based on distance between types of sources known to generate odor and the receptor. Projects that would site an odor source or a receptor farther than the applicable screening distance, shown in Table 3.2-16, would not result in a significant odor impact.

**Table 3.2-16: Odor Screening Distances**

| Land Use/Type of Operation | Project Screening Distance |
|---|---|
| Wastewater Treatment Plant | 2 miles |
| Wastewater Pumping Facilities | 1 mile |
| Sanitary Landfill | 2 miles |
| Transfer Station | 1 mile |
| Composting Facility | 1 mile |
| Petroleum Refinery | 2 miles |
| Asphalt Batch Plant | 2 miles |
| Chemical Manufacturing | 2 miles |
| Fiberglass Manufacturing | 1 mile |
| Painting/Coating Operations | 1 mile |

**Table 3.2-16 (cont.): Odor Screening Distances**

| Land Use/Type of Operation | Project Screening Distance |
|---|---|
| Rendering Plant | 2 miles |
| Coffee Roaster | 1 mile |
| Food Processing Facility | 1 mile |
| Confined Animal Facility/Feed Lot/Dairy | 1 mile |
| Green Waste and Recycling Operations | 1 mile |
| Metal Smelting Plants | 2 miles |
| Source: BAAQMD, 2017. | |

*Project Construction*

Diesel exhaust and VOCs would be emitted during construction of the project resulting from heavy-duty construction equipment and asphalt paving activities, both of which could be objectionable odors to some populations. However, emissions would disperse rapidly from the site and construction activities would be relatively low in intensity. Therefore, it is not anticipated that construction-related activities would create objectionable odors affecting a substantial number of people. As such, construction odor impacts would be less than significant.

*Project Operation*

As shown in Table 3.2-16, land uses considered associated with odors typically include agricultural operations (dairies, feedlots, etc.), landfills, wastewater treatment plants, refineries, and other types of industrial land uses. The project does not propose any of these land uses or other land uses typically associated with emitting objectionable odors. During operation of the project, potential sources of odor would primarily consist of vehicles travelling to and from the site. These occurrences would not produce a significant amount of odors; therefore, odors generated from project operations would be less than significant.

As a residential development, the project has the potential to place sensitive receptors near existing odor sources. There are no major odor generating sources (as listed in Table 3.2-16) within screening distance of the site. Therefore, the uses in the vicinity of the project would not cause substantial odor impacts to the project.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

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# 3.3 - Biological Resources

## 3.3.1 - Introduction

This chapter describes the existing biological setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on a site reconnaissance survey performed by FirstCarbon Solutions (FCS) Senior Biologist Brian Mayerle and FCS Biologist Robert Carroll as well as review of the Pleasanton General Plan and the Pleasanton General Plan EIR.

FCS peer reviewed a Biological Resources Assessment (BRA) prepared for the applicant by Live Oak Associates (LOA) on June 12, 2017, titled "Biotic Evaluation." The BRA included an assessment of sensitive biological resources found within the project site; a detailed discussion of existing conditions on-site including a list of special-status species, water and/or wetlands, and their potential for occurrence, recommendations, and mitigation measures where appropriate. LOA conducted an additional focused rare plant survey on June 26, 2018, which included an analysis for rare plants within areas proposed for residential development and landslide repair on the project site. The BRA and June 2018 rare plant survey are provided in Appendix C.

## 3.3.2 - Environmental Setting

### Site Conditions

The project site is approximately 154 acres and is located on the east side of Alisal Street in the southeastern portion of the City of Pleasanton, Alameda County, California. The project site is bordered by homes to the west and south; agricultural fields and residences to the north; and open rangelands to the east. The project site is located in the Livermore, California, United States Geological Survey (USGS) 7.5-minute quadrangle.

The 154-acre project site is primarily used as agricultural land for growing hay and rangeland for cattle. Land uses in surrounding areas include open space/agricultural (i.e. rangeland), residential golf courses, and major and minor roadways. The western portion of the site is fairly level at 380 feet (116 meters) and increases in slope towards the eastern edge to approximately 480 feet (147 meters). None of the soils on the project site are serpentine or alkaline; therefore, they would not be expected to support special-status plant species that are endemic to these soil types.

### Biological Communities

The project site consists of agricultural/rangeland and seasonal wetlands and intermittent drainages.

#### *Agricultural/Rangeland*

Agricultural/Rangeland makes up the vast majority of the project site. Hay is grown, cut, raked, and disced regularly in the western portion of the site. The eastern portion of this habitat is used as rangeland. Vegetation characteristic of the Agricultural/Rangeland habitat includes:

- wild oats (*Avena* sp.)
- soft chess (*Bromus hordeaceus*)

- red brome (*Bromus madritensis* ssp. *rubens*)
- Italian thistle (*Carduus pycnocephalus*)
- yellow star thistle (*Centaurea solstitialis*)
- bull thistle (*Cirsium vulgare*)
- bindweed (*Convolvulus arvensis*)
- dove weed (*Croton setigerus*)
- goldenbush (*Ericameria* sp.)
- filaree (*Erodium* sp.)
- bristly ox tongue (*Helminthotheca echioides*)
- tarweed (*Hemizonia* sp.)
- summer mustard (*Hirschfeldia incana*)
- barley (*Hordeum marinum*)
- willowleaf lettuce (*Lactuca saligna*)
- prickly lettuce (*Lactuca serriola*)
- bird's foot trefoil (*Lotus corniculatus*)
- curly dock (*Rumex crispus*)
- milk thistle (*Silybum marianum*)
- purple salsify (*Tragopogon porrifolius*)

### *Seasonal Wetlands and Drainages*

Four seasonal wetlands occur on the project site, totaling approximately 1.30 acres. Three of the four wetlands (totaling 0.85 acre) occur on slopes within the preserved open space areas of the site, at or above the 25% slope line.

Hydrophytic species dominant in these seasonal wetland areas, along with their wetland indicators, included Mediterranean canary grass (*Phalaris arundinacea*) and Mediterranean barley (*Hordeum marinum*). Wildlife expected to use the seasonal wetlands of the site would be similar to those described in adjacent habitats.

Two wetland delineations have been conducted on the project site, one by Olberding in 2008 which was verified by the U.S. Army Corps of Engineers (USACE), and one by LOA in January and April 2015. The USACE verified the wetland determination on December 1, 2017.

Four intermittent drainages occur within the preserved open space area of the project site and would not therefore be impacted by project construction: these include a tributary of Sycamore Creek (205 linear feet) in the northern portion and three isolated intermittent drainages (totaling 692 linear feet) in the central portion of the site. All reaches were dry during site visits by LOA between 2014 and 2017.

Drainage 1 in the northern portion of the site is hydrologically connected to other waters of the U.S. and is considered jurisdictional by USACE. The remaining three hydrologic features are isolated and non-jurisdictional.

Channels were devoid of vegetation, or supported upland species such as wild oats, soft chess, bull thistle, bindweed, Bermuda grass (*Cynodon dactylon*), spike rush, Italian rye grass (*Festuca perennis*),

summer mustard, barley, prickly lettuce, bird's foot trefoil, milk thistle, and clover (*Trifolium* sp.). Exhibit 3.3-1 depicts both seasonal wetlands and drainages within the project site.

## Wildlife

The vegetation community and land cover types discussed above provide habitat for a limited number of local wildlife species. Wildlife observed on the site during LOA's 2012 through 2017 surveys included reptiles such as the western fence lizard (*Sceloporus occidentalis occidentalis*), western yellow-bellied racer (*Coluber constrictor mormon*), and northern Pacific rattlesnake (*Crotalus oreganus oreganus*), which was identified by remains of a shedded skin; birds such as turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), unidentified gull species, killdeer (*Charadrius vociferus*), northern mockingbird (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), barn swallow (*Hirundo rustica*), western blue bird (*Sialia mexicana*), and house finch (*Carpodacus mexicanus*); and mammals that are likely to occur on the site, such as Botta's pocket gopher (*Thomomys bottae*) via presence of burrows, and black-tailed deer (*Odocoileus hemionus columbianus*).

Medium-sized and larger mammals that have not been directly observed but that may occur on the site include cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), native gray fox (*Urocyon cinereoargenteus*), American badger, striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and introduced red fox (*Vulpes vulpes*).

## Special-status Species

Special-status species are plant and animal species that have been afforded special recognition by federal, State, or local resource agencies or organizations. Listed and special-status species are of relatively limited distribution and may require specialized habitat conditions. Special-status species are defined as meeting one or more of the following criteria:

- Listed or proposed for listing under the California Endangered Species Act (CESA) or the Federal Endangered Species Act (FESA);
- Protected under other regulations (e.g. Migratory Bird Treaty Act (MBTA));
- California Department of Fish and Wildlife (CDFW) Species of Special Concern;
- Plant species ranked by the California Native Plant Society (CNPS); or
- Receive consideration during environmental review under California Environmental Quality Act (CEQA).

Exhibit 3.3-2 illustrates recorded occurrences of special-status species within 3 miles of the project site.

### *Listed and Special-status Plants*

Special-status plant communities are considered sensitive biological resources when federal, state, or local laws regulate their development, limited distributions, and habitat requirements of special-status plant or wildlife species that occur within them. There are no sensitive plant communities recorded on or near the project site.

The Special-status Plant Species Table (Biotic Evaluation, Appendix C) identifies 46 special-status plant species and CNPS sensitive species that have been recorded to occur within the Livermore, California, quadrangle and the eight surrounding quadrangles (Diablo, Tassajara, Byron Hot Springs, Dublin, Altamont, Niles, La Costa Valley, and Mendenhall Springs), as recorded by the California Natural Diversity Database (CNDDB) and the California Native Plant Society's Electronic Inventory (CNPSEI) (CDFW 2017; CRPR 2017). The table also includes each species' status, required habitat, and potential to occur within the project site.

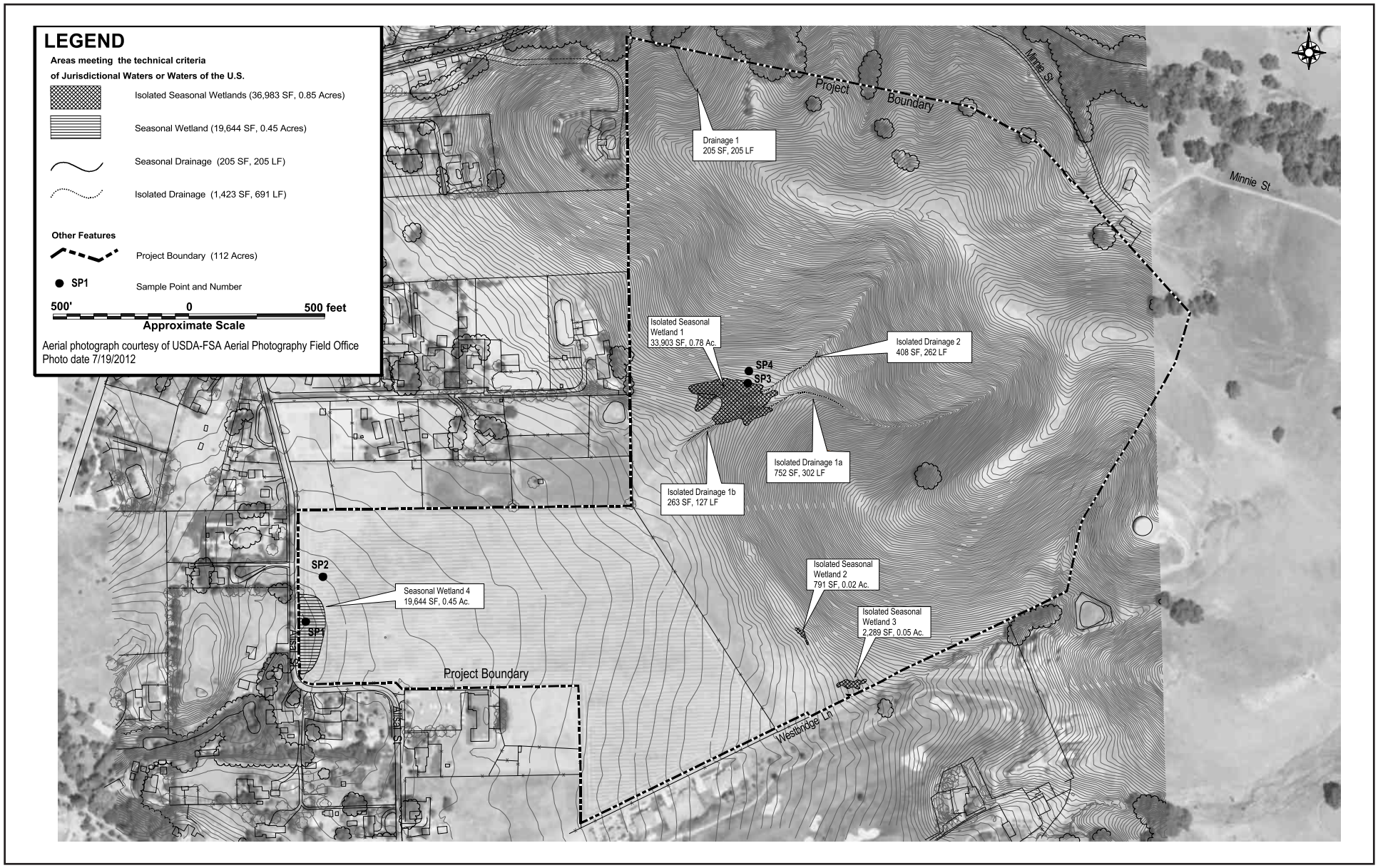
Several individual Congdon's tar plants (*Centromadia parryi* ssp. *congdonii*) were observed during an LOA reconnaissance survey in 2012. However, subsequent surveys conducted between 2014 and 2017 did not result in species observations, although not all of the subsequent surveys were conducted during the plants' blooming period.

Potential habitat for one other special-status species, big tarplant (*Blepharizonia plumose*) is also present on the project site. LOA has scheduled follow up focused surveys for both Congdon's tar plant and big tarplant for summer 2018. All remaining special-status plant species have been determined unlikely to occur on-site based upon the results of the species review, habitat present, and the reconnaissance-level field assessment. The project site lacks suitable habitat conditions, most notably serpentine and alkaline soils and rock outcroppings, to support any special-status plant species.

### *Listed and Special-status Wildlife*

The Special-Status Wildlife Species Table (Biotic Evaluation, Appendix C) identifies 29 federal and state listed threatened and/or endangered wildlife species, and State Species of Special Concern that have been recorded in the CNDDB (CDFW 2017) as occurring within the Livermore, California, quadrangle (USGS 1986) and the eight surrounding quadrangles (Diablo, Tassajara, Byron Hot Springs, Dublin, Altamont, Niles, La Costa Valley, and Mendenhall Springs). The table also includes each species' status, required habitat, and potential to occur within the project site. Of these, 10 special-status wildlife species have the potential to occur in the project site. The remaining species have also been included in the table to justify their exclusion from further discussion. One species, the California tiger salamander, is listed as threatened under the Federal Endangered Species Act. The following special-status species have the potential to occur within the project site:

- California tiger salamander (*Ambystoma californiense*)
- Burrowing owl (*Athene cunicularia*)
- American badger (*Taxidea taxus*)
- Birds protected by the Migratory Bird Treaty Act (MBTA):
  - Golden eagle (*Aquila chrysaetos*)
  - Grasshopper sparrow (*Ammodramus savannarum*)
  - Loggerhead shrike (*Lanius ludovicianus*)
  - Northern harrier (*Circus hudsonius*)
  - White-tailed kite (*Elanus leucurus*)
- Pallid bat (*Antrozous pallidus*)
- Townsend's big-eared bat (*Corynorhinus townsendii*)
- Callippe silverspot butterfly (*Speyeria callippe callippe*)




Source: Live Oak Associates, Inc., April 2017.

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Exhibit 3.3-1
Seasonal Wetlands and Drainages

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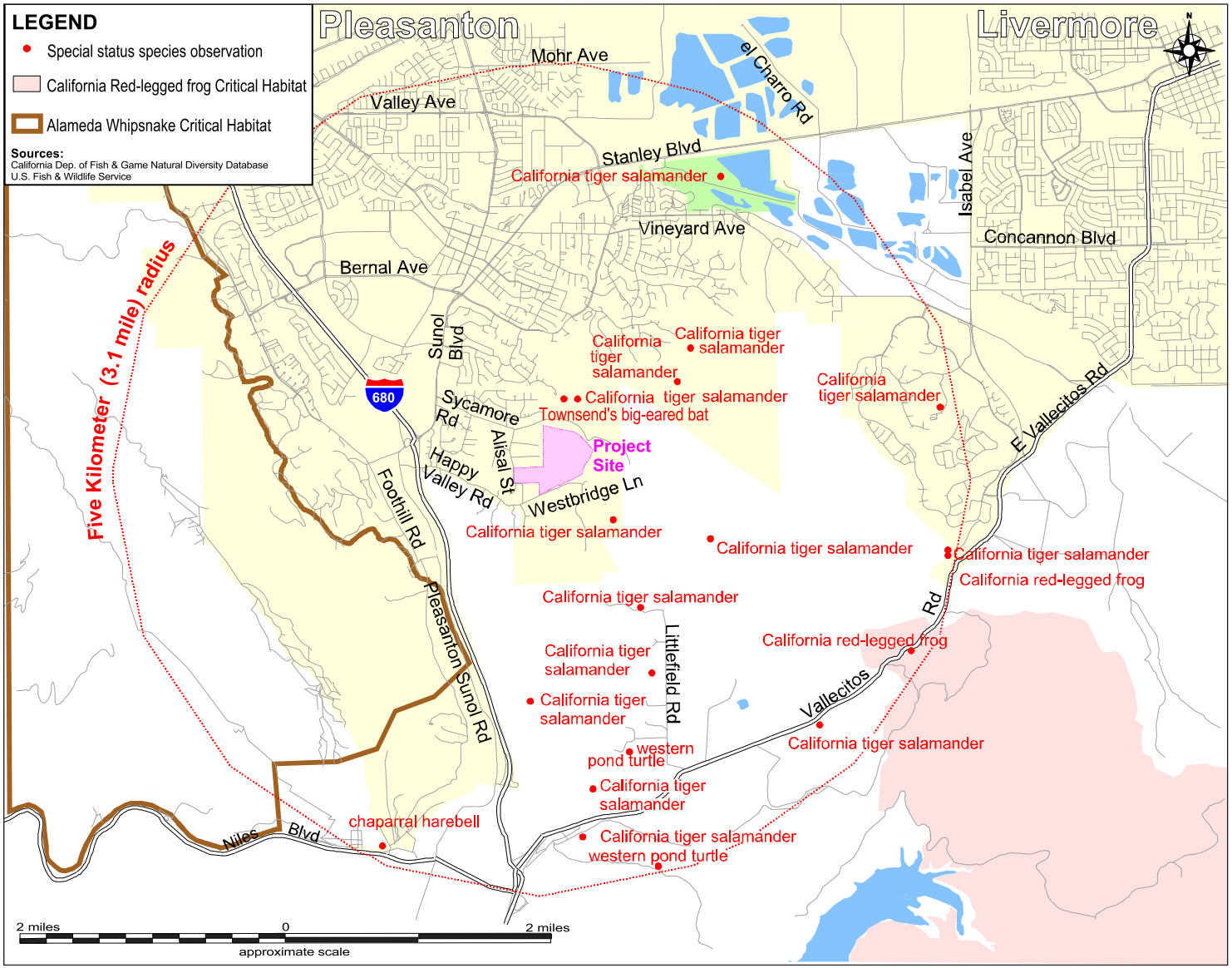


Source: Live Oak Associates, Inc., April 2017.

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Exhibit 3.3-2
Special-Status Species, 3 Mile Radius

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### *Amphibians*

*California tiger salamander*

The California tiger salamander is listed as threatened under the Federal and State Endangered Species Acts. No suitable breeding habitat is present on the project site (breeding habitat most commonly includes vernal pools or other ephemeral water sources surrounded by valley and foothill grasslands; occasionally, streams or man-made ponds with no predatory fish). The species has been documented breeding in ponds within 1.5 miles of the project site. Furthermore, there are five breeding ponds reported in the CNDDB that are within 1.2 miles of the project site. No focused surveys were conducted for this species, and it was not found during LOA's field surveys. Fourteen recorded occurrences of this species are within 3 miles of the project site. There is a potential for this species to occur on the project site.

### *Birds*

*Burrowing owl*

The burrowing owl is a California state species of special concern. Suitable habitat (ground squirrel and small burrows in open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation) is not currently present within the project site. No focused surveys were conducted for this species, and it was not found during LOA's field surveys. No recorded occurrences of this species are within 3 miles of the project site. There is a potential for this species to occur on the project site.

*Golden eagle*

The golden eagle is a California state species of special concern. Nest sites for golden eagles are most often located on cliffs, but they will also use trees, the ground, and a variety of man-made structures. Golden eagles forage for small mammals and birds in open grassland and shrubland. No recorded occurrences of this species are within 3 miles of the project site and it was not found during LOA's field surveys. No suitable nesting habitat is present on the project site; however, there is potential for occurrence based on available foraging habitat.

*Grasshopper sparrow*

The grasshopper sparrow is a California state species of special concern. This species will nest at the base of a clump of grasses or forbs in a slight depression on the ground. Primarily insectivorous, grasshopper sparrows forage on invertebrates, forb seeds, and grasses. Suitable nesting and foraging habitat (dry, dense grasslands with a variety of tall forbs and scattered shrubs) is present on the project site. There are no recorded occurrences of this species within 3 miles of the project site and it was not found during LOA's field surveys. There is potential for this species to occur on the project site.

*Loggerhead shrike*

The loggerhead shrike is a California state species of special concern. This species inhabits open areas with clear visibility for hunting, perches for scanning, and dense shrubs and brush for nesting. This species inhabits shrub lands or open woodlands with a fair amount of grass cover and areas of bare ground. The project site's agricultural/rangeland have the potential to provide foraging habitat, but no suitable nesting habitat is present on the site. Individuals may also occasionally disperse

through the project site. There are no recorded occurrences of this species within 3 miles of the project site and it was not found during LOA's field surveys. There is a potential for this species to occur on the project site.

*Northern harrier*

The northern harrier is a California state species of special concern. This species is most commonly found nesting in meadows, grasslands, open rangeland, desert sinks, and fresh and saltwater emergent wetland. Northern harriers feed on small mammals, birds, amphibians, reptiles, crustaceans, and invertebrates (CWHRS 2008). Although there are no recorded occurrences of this species within 3 miles of the project site and it was not found during LOA's field surveys, suitable nesting and foraging habitat is present on the project site. Therefore, there is potential for this species to occur.

*White-tailed kite*

The white-tailed kite is a fully protected species. This species nests in rolling foothills and valley margins with scattered oaks, riparian woodlands, or marshes next to deciduous woodland, and forages in open grasslands, meadows, or marshes. White-tailed kites forage for small rodents and insects in agricultural areas, especially alfalfa fields. Nests are typically built in available trees near hunting grounds. No nesting habitat is available on the project site, but there is presence of moderate-quality foraging habitat. This species has been observed on neighboring properties. There is potential for this species to occur on the project site.

### *Mammals*

*American badger*

The American badger is a California state species of special concern. Suitable habitat (grassland and rangeland) is present throughout the project site. There have been no occurrences within 3 miles of the project site, however; there is a potential for this species to occur on the project site because of suitable habitat present.

*Pallid bat*

The pallid bat is a California state species of special concern. The project site lacks suitable roosting habitat because it lacks caves, rock outcroppings, or buildings; however, the presence of suitable foraging habitat on the northern boundary of the project site provides potential for this species to occur. No focused surveys were conducted for this species, and it was not found during field surveys. No recorded occurrences of this species are within 3 miles of the project site. Based on the lack of mature trees and other potential habitat features throughout the site, potential to occur is low.

*Townsend's big-eared bat*

The Townsend's big-eared bat is a California state species of special concern. Hibernating roost and maternity roost sites for this species include caves, mines, tunnels, buildings, and other man-made structures (CWHRS 2000). The hibernating period is November through February, and the maternity period lasts from April through mid-September. Townsend's big-eared bat is also known to utilize very-large-diameter (greater than 100 inches diameter at breast height [DBH]) hollow redwoods for day roosts and temporary night roosts (Gellman and Zielinski 1996); however, no redwoods of this size occur within or directly adjacent to any of the work sites. One recorded occurrence of this

species is located within 3 miles of the project site. There is a low potential for this species to occur on the project site due to the lack of suitable habitat on the site.

#### *Insects*

*Callippe silverspot butterfly*

The Callippe silverspot butterfly is a federally endangered subspecies of butterfly that occurs only in two separate grassland habitats in the San Francisco Bay Area. The species lay their eggs on the dry remains of the larval food plant, Johnny jump-up (*Viola pedunculata*), or on the surrounding debris. Thus, the species is limited in its range to areas inhabited by viola plants. Since no viola plants are on the project site, there is limited breeding area and no mitigation measures are needed for the species.

## 3.3.3 - Regulatory Framework

### Federal

#### *Federal Endangered Species Act*

The U.S. Congress passed the Federal Endangered Species Act (FESA) in 1973 to protect those species that are endangered or threatened with extinction. FESA is intended to operate in conjunction with the National Environmental Policy Act (NEPA) to help protect the ecosystems upon which endangered and threatened species depend.

FESA prohibits the "take" of endangered or threatened wildlife species. "Take" is defined to include harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting wildlife species or any attempt to engage in such conduct (FESA Section 3 [(3)(19)]). Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns (50 CFR §17.3). Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns (50 CFR §17.3). Actions that result in take can result in civil or criminal penalties.

FESA and Clean Water Act (CWA) Section 404 guidelines prohibit the issuance of wetland permits for projects that jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species. The USACE must consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) when threatened or endangered species under their jurisdiction may be affected by a proposed project. In the context of the proposed project, FESA would be initiated if development resulted in take of a threatened or endangered species or if issuance of a Section 404 permit or other federal agency action could result in take of an endangered species or adversely modify critical habitat of such a species.

#### *Migratory Bird Treaty Act*

Raptors (birds of prey), migratory birds, and other avian species are protected by a number of State and federal laws. The federal Migratory Bird Treaty Act (MBTA) prohibits the killing, possessing, or trading of migratory birds except in accordance with regulations prescribed by the Secretary of Interior.

### *Clean Water Act*

The United States Army Corps of Engineers regulates discharge of dredge or fill material into waters of the U.S. under Section 404 of the Clean Water Act (CWA). "Discharges of fill material" is defined as the addition of fill material into waters of the U.S., including, but not limited to the following: placement of fill that is necessary for the construction of any structure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, and other uses; causeways or road fills; fill for intake and outfall pipes and subaqueous utility lines [33 C.F.R. §328.2(f)]. In addition, Section 401 of the CWA (33 U.S.C. 1341) requires any applicant for a Federal license or permit to conduct any activity that may result in a discharge of a pollutant into waters of the U.S. to obtain a certification that the discharge will comply with the applicable effluent limitations and water quality standards.

Waters of the U.S. include a range of wet environments such as lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, and wet meadows. Boundaries between jurisdictional waters and uplands are determined in a variety of ways depending on which type of waters is present. Methods for delineating wetlands and non-tidal waters are described below.

- Wetlands are defined as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" [33 C.F.R. §328.3(b)]. Presently, to be a wetland, a site must exhibit three wetland criteria: hydrophytic vegetation, hydric soils, and wetland hydrology existing under the "normal circumstances" for the site.
- The lateral extent of non-tidal waters is determined by delineating the ordinary high water mark (OHWM) [33 C.F.R. §328.4(c)(1)]. The OHWM is defined by the Corps as "that line on shore established by the fluctuations of water and indicated by physical character of the soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas" [33 C.F.R. §328.3(e)].

## State

### *California Endangered Species Act*

The State of California enacted the California Endangered Species Act (CESA) in 1984. CESA is similar to the FESA but pertains to State-listed endangered and threatened species. CESA requires state agencies to consult with the California Department of Fish and Wildlife (CDFW), formally California Department of Fish and Game, when preparing California Environmental Quality Act (CEQA) documents. The purpose is to ensure that the state lead agency actions do not jeopardize the continued existence of a listed species or result in the destruction, or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available (Fish and Game Code §2080). CESA directs agencies to consult with CDFW on projects or actions that could affect listed species, directs CDFW to determine whether jeopardy would occur and allows CDFW to identify "reasonable and prudent alternatives" to the project consistent with conserving the species. CESA allows CDFW to authorize exceptions to the State's

prohibition against take of a listed species if the "take" of a listed species is incidental to carrying out an otherwise lawful project that has been approved under CEQA (Fish & Game Code § 2081).

### *California Department of Fish and Game Codes*

Fully protected fish species are protected under Section 5515; fully protected amphibian and reptile species are protected under Section 5050; fully protected bird species are protected under Section 3511; and fully protected mammal species are protected under Section 4700. The California Fish and Game Code defines take as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." Except for take related to scientific research, all take of fully protected species is prohibited. Section 3503 of the California Fish and Game Code prohibits the killing of birds or the destruction of bird nests. Section 3503.5 prohibits the killing of raptor species and the destruction of raptor nests. Sections 2062 and 2067 define endangered and threatened species.

### *California Department of Fish and Wildlife Species of Concern*

In addition to formal listing under FESA and CESA, species receive additional consideration by CDFW and local lead agencies during the CEQA process. Species that may be considered for review are included on a list of "Species of Special Concern," developed by the CDFW. It tracks species in California whose numbers, reproductive success, or habitat may be threatened. In addition to Species of Special Concern, the CDFW identifies animals that are tracked by the CNDDB, but warrant no federal interest and no legal protection. These species are identified as California Special Animals.

### *Porter-Cologne Water Quality Control Act*

CDFW is a trustee agency that has jurisdiction under Section 1600 et seq. of the California Fish and Game Code. Under Sections 1602 and 1603, a private party must notify CDFW if a proposed project will "substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by the department, or use any material from the streambeds . . .except when the department has been notified pursuant to Section 1601." Additionally, CDFW may assert jurisdiction over native riparian habitat adjacent to aquatic features, including native trees over 4 inches DBH. If an existing fish or wildlife resource may be substantially adversely affected by the activity, CDFW may propose reasonable measures that will allow protection of those resources. If these measures are agreeable to the parties involved, they may enter into an agreement with CDFW identifying the approved activities and associated mitigation measures.

Section 13260(a) of the Porter-Cologne Water Quality Control Act (contained in the California Water Code) requires any person discharging waste or proposing to discharge waste, other than to a community sewer system, within any region that could affect the quality of the waters of the State (all surface and subsurface waters) to file a report of waste discharge. The discharge of dredged or fill material may constitute a discharge of waste that could affect the quality of waters of the State. All of the wetlands and waterways in the project site are waters of the State, which are protected under this act.

Historically, California relied on its authority under Section 401 of the CWA to regulate discharges of dredged or fill material to California waters. That section requires an applicant to obtain "water quality certification" from the State Water Resources Control Board (SWRCB) through its Regional

Water Quality Control Boards (RWQCB) to ensure compliance with state water quality standards before certain federal licenses or permits may be issued. The permits subject to Section 401 include permits for the discharge of dredged or fill materials (CWA Section 404 permits) issued by the USACE. Waste discharge requirements under the Porter-Cologne Water Quality Control Act were typically waived for projects that required certification. With the recent changes that limited the jurisdiction of wetlands under the CWA, the SWRCB has needed to rely on the report of waste discharge process.

### *California Native Plant Society*

The California Native Plant Society (CNPS) maintains a rank of plant species native to California that has low population numbers, limited distribution, or are otherwise threatened with extinction. This information is published in the Inventory of Rare and Endangered Vascular Plants of California. Potential impacts to populations of CNPS ranked plants receive consideration under CEQA review. Definitions of the CNPS ranks follow below.

- **Rank 1A:** Plants presumed Extinct in California
- **Rank 1B:** Plants Rare, Threatened, or Endangered in California and elsewhere
- **Rank 2:** Plants Rare, Threatened, or Endangered in California, but more numerous elsewhere
- **Rank 3:** Plants about which we need more information—A Review List
- **Rank 4:** Plants of limited distribution—A Watch List

All plants appearing on CNPS List 1 or 2 are considered to meet CEQA Guidelines Section 15380 criteria. While only some of the plants ranked 3 and 4 meet the definitions of threatened or endangered species, the CNPS recommends that all Rank 3 and Rank 4 plants be evaluated for consideration under CEQA.

## Local

Biological resources related goals, policies, and programs of the Pleasanton General Plan 2005–2025 serve to guide the location, design, and quality of development in order to protect important wildlife, plants, and their associated habitats.

### *Conservation and Open Space Element*

- **Goal 1:** Practice sustainability to preserve and protect natural resources and open space.
- **Goal 2:** Preserve and enhance the natural resources of the Planning Area, including plant and wildlife habitats, heritage trees, scenic resources, and watercourses.
- **Policy 1:** Preserve and enhance natural wildlife habitats and wildlife corridors
  - **Program 1.1:** Complete a comprehensive study of the ecosystems and wildlife habitat areas within and around the Planning Area, and develop and implement ordinances and policies that will provide for their preservation and enhancement.
  - **Program 1.2:** Identify land within the Planning Area which could be reclaimed as viable wildlife habitat. Study methods to re-establish viable plant and animal communities in these areas. Develop standards to accomplish habitat reclamation which: (1) specify the minimum acreage, topography, flora, fauna, and other characteristics necessary to ensure survival of wildlife habitat areas; (2) specify necessary length, breadth, flora, fauna, and

other characteristics necessary to ensure the protection and use of wildlife corridors; and (3) prevent the creation of open space islands, unless they are connected through a series of viable wildlife corridors in accordance with specified standards.

- **Program 1.3:** Preserve and enhance the resource value of wetlands through project development design measures. These measures should be based in part on jurisdictional wetlands delineation in accordance with current Army Corps of Engineers criteria, for projects which are known to have or that may have wetlands present within their boundaries.
- **Program 1.4:** Develop and implement ordinances and policies that provide for the preservation of wildlife corridors, and establish mitigation requirements which minimize the barriers across wildlife corridors that roadways and developments can create.
- **Program 1.5:** Investigate existing private, State, and federal incentive programs and develop City incentive programs that encourage property owners to cooperate in the preservation and restoration of wildlife habitat.
- **Program 1.6:** Analyze potential impacts on wildlife populations and habitats before developing projects, using the California Environmental Quality Act (CEQA) process or other processes, as relevant.
- **Program 1.8:** Design site sensitive recreation or interpretive facilities to minimize intrusion within natural public open space. Limit public access, including hiking trails, into sensitive habitat area, when warranted.
- **Program 1.9:** Plant native species wherever possible in public and private landscaping, and provide wildlife habitat in new landscaping, where appropriate.
- **Program 1.10:** Design storm retention and drainage ponds, groundwater-recharge areas, and watercourse as wildlife habitats, when appropriate and environmentally sound.
- **Program 1.12:** Support appropriate development intensity adjacent to areas designated as Wildlands Overlay.
- **Program 1.13:** Provide activities and educational opportunities related to preserving and enhancing natural resources and the environment.

- **Policy 2:** Preserve heritage trees throughout the Planning Area.
  - **Program 2.1:** Strongly encourage preservation of heritage trees; where preservation is not feasible, the City will require tree replacement or a contribution to the Urban Forestry Fund. The City encourages no net loss of trees.
- **Policy 3:** Preserve and enhance streambeds and channels in a natural state.
- **Goal 3:** Promote natural resource production in accordance with sensitive environmental management practices.
- **Goal 5:** Preserve and protect existing and proposed open space lands for public health and safety, recreational opportunities, natural resources (e.g., agriculture, sand and gravel mining), sensitive viewsheds, and biological resources.
- **Policy 6:** Protect all large continuous areas of open space, as designated on the General Plan Map, from intrusion by urban development.
  - **Program 6.1:** Explore working with the Tri-Valley Conservancy or similar entities to use transfer of development rights and conservation easements to preserve open space.
  - **Program 6.2:** Establish appropriate levels for the development of land adjacent to areas designated as Wildlands Overlay through studies which indicate the types of development posing the least potential negative impact on wildlife habitat.

- **Program 6.3:** Preserve large blocks of open space land by encouraging the clustering of development.
- **Program 6.4:** Investigate methods and pursue opportunities to retain areas designated on the General Plan Map as Open Space for permanent open-space use through acquisition, conservation easements, establishment of land trusts, etc.
- **Program 6.5:** Encourage developers to publicly dedicate fee title to open space lands: (1) that are determined to have considerable public recreational, scenic, or natural resource value; (2) where operational costs can be met; and (3) where significant potential health or safety hazards do not exist. Developers should offer public access to the fullest extent possible.
- **Program 6.6:** Develop zoning districts with open space uses appropriate for the adopted Open Space categories listed on the General Plan Map and that implement the policies and programs of the General Plan.
- **Program 6.7:** Develop zoning districts with open space uses appropriate for the adopted Open Space categories listed on the General Plan Map and that implement the policies and programs of the General Plan.

- **Goal 6:** Achieve an extensive open-space system featuring a wide variety of opportunities to serve the diverse needs of the public.
- **Policy 7:** Preserve and expand open-space opportunities, including open-space access to the public.
  - **Program 7.3:** Encourage public accessibility to appropriate public open-space land or in private open-space land that could accommodate public-access open-space trails.
  - **Program 7.4:** Provide adequate parking and staging areas for open space access and include facilities such as picnic areas, restrooms, and potable water.
- **Policy 8:** Preserve as permanent open space all areas of outstanding scenic qualities or areas which provide extraordinary views of natural and human-made objects.
  - **Program 8.4:** Encourage developers to work with entities such as the Tri-Valley Conservancy to dedicate scenic/conservation easements for private open-space areas possessing exceptional natural, scenic, and/or vegetation or wildlife habitat qualities.
  - **Program 8.5:** Encourage developers to provide open-space buffers in areas where there are conflicting land uses.

### *Water Element*

- **Goal 2:** Provide healthy water courses, riparian functions, and wetlands for humans, wildlife, and plants.
- **Policy 2:** Preserve and enhance streambeds and channels in a natural state.
  - **Program 2.1:** Develop and implement ordinances and policies that provide for the preservation and restoration of riparian functions, and establish mitigation requirements for modifications to riparian corridors.
  - **Program 2.2:** Develop policies and standards in cooperation with Zone 7 that include restoring riparian corridors when flood- and erosion-control activities require channelization.
  - **Program 2.3:** Utilize habitat preservation and reclamation measures when designing flood- and erosion-control projects to limit impacts on plants and wildlife.

- **Program 2.7:** Locate wetland buffers between a wetland and proposed, existing, or potential development. These buffers should be of sufficient width and size to protect species most sensitive to development and should be designed to complement the habitat value of the wetland resource.
- **Program 2.8:** Require that future developments result in no net loss of wetlands.

- **Goal 7:** Reduce stormwater runoff and maximize infiltration of naturally occurring rainwater so as to improve surface and subsurface water quality.
- **Policy 10:** Encourage a built environment that minimizes impervious surfaces.
- **Policy 11:** Implement stormwater runoff requirements, as required by the State Regional Water Quality Control Board and the Alameda County-wide Clean Water Program, with as little impact on development and business costs as possible.

### *Subregional Planning Element*

- **Policy 11:** Preserve and enhance natural wildlife habitats and wildlife corridors.
  - **Program 11.1:** Share information about important ecological resources and promote a cooperative program for preserving them at the subregional level.
  - **Program 11.2:** Promote the preparation of comprehensive guidelines and strategies to protect and enhance the significant natural communities of the Tri-Valley.
  - **Program 11.3:** Promote a subregional approach to protecting valuable habitat areas, through mitigation banking, conservation and open space easements, and other means.

## 3.3.4 - Methodology

Descriptions and analysis in this section are based on the BRA prepared by LOA. The BRA is provided in Appendix C. The methodology of the BRA is summarized below.

### Biological Resources Assessment

As noted above, LOA prepared a BRA dated June 12, 2017. FCS began with a thorough review of relevant literature followed by a reconnaissance-level field survey.

### *Literature Review*

FCS biologists examined existing environmental documentation for the project site and immediate vicinity. This documentation included the BRA noted above, literature pertaining to habitat requirements of special-status species potentially occurring near the site, and federal register listings, protocols, and species data provided by the USFWS and CDFW.

FCS biologists reviewed the USGS 7.5-minute Livermore, California quadrangle map and aerial photographs as a preliminary analysis of the existing conditions within the project site and immediate vicinity. Information obtained from the review of the topographic maps included elevation range, general watershed information, and potential drainage feature locations (USGS 1986). Aerial photographs provide a perspective of the most current site conditions relative to on-site and off-site land use, plant community locations, and potential locations of wildlife movement corridors. FCS also reviewed United States Department of Agriculture soil surveys to establish if soil conditions on-site are suitable for any special-status plant species.

FCS biologists compiled a list of threatened, endangered, and otherwise special-status species previously recorded within the general project vicinity. The list was based on a search of the CDFW's CNDDB, a special-status species and plant community account database, the CNPS's Electronic Inventory of Rare and Endangered Vascular Plants of California database, and a USFWS Information Planning and Conservation Report Search, for the Livermore, California USGS 7.5-minute quadrangle maps. The database search results can be found in Appendix C.

The CNDDB Biogeographic Information and Observation System database was used to determine the distance between known recorded occurrences of special-status species and the project site.

### *Field Survey*

FCS Senior Biologist Brian Mayerle and FCS Biologist Robert Carroll conducted the reconnaissance-level field survey on June 22, 2017. The reconnaissance-level survey was conducted on foot during daylight hours. The purpose of the survey was not to extensively search for every species occurring within the project site, but to ascertain general site conditions and identify potentially suitable habitat areas for various special-status plant and wildlife species. Special-status species were identified during the literature review were verified during the reconnaissance-level survey for mapping accuracy. Special attention was paid to sensitive habitats and areas potentially supporting special-status floral and faunal species.

Common plant species observed during the reconnaissance-level survey were identified by visual characteristics and morphology in the field and recorded in a field notebook. Uncommon and less familiar plants were identified later with the use of taxonomical guides, such as Clarke et al. (2007), Hitchcock (1971), McAuley (1996), and Munz (1974). Taxonomic nomenclature used in this study follows Baldwin et al. (2012). Common plant names, when not available from Baldwin et al. (2012), were taken from other regionally specific references.

Wildlife species detected during the reconnaissance-level survey by sight, calls, tracks, scat, or other signs were recorded in a field notebook. Notations were made regarding suitable habitat for those special-status species determined to potentially occur within the project site (CDFW 2017). Appropriate field guides were used to assist with species identification during surveys, such as Peterson (2010), Reid (2006), and Stebbins (2003).

## Special Status Plant Survey

LOA plant and wetland ecologist, Pamela Peterson, conducted a focused survey for rare plants within areas proposed for residential development and landslide repair, including a 75 foot buffer, on the approximately 154 Spotorno Ranch project site. The June 2018 survey was timed to coincide with the blooming season for Congdon's tarplant and shining navarretia. All plant species encountered were identified to the taxonomic level necessary to determine whether it was a special status plant species using the Jepson Manual Second Edition (Baldwin et. al. 2012).

## 3.3.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, biological resources impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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?

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

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 other means?

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

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to biological resources and found that the project would have a potentially significant impact on biological resources without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR. As shown in Appendix J, Mitigation Measures J2, J5, and J7, through J9 are not applicable to the project. Mitigation Measures J1, J3, J4, and J10 are applicable to the proposed project. Mitigation Measure J6 requires consultation with CDFW regarding any areas within their jurisdiction. This portion of the mitigation would not apply to the project because there is no riparian corridor or related riparian habitat on-site. This mitigation also requires consultation with the Corps prior to any activity that would occur within the jurisdictional limits of wetlands. This portion of the mitigation will apply to the Spotorno Ranch Project. These mitigation measures, applied to the HVSP for biological resources, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the impacts to biological resources of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation as envisioned in the HVSP FEIR. As shown in Exhibit 2-6b in Section 2, Project Description and discussed in more detail in Section 3-12, Transportation, the project would incorporate new trails as envisioned in the Public Review Draft of the update to the Trails Master Plan. The HVSP FEIR included analysis of impacts of these general trail alignments as well as the Bypass Road, which would have run through the hillside portion of the project site. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to biological resources. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.3.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

### Special-status Species

| | |
|---|---|
| **Impact BIO-1:** | **The proposed project may have a substantial adverse impact on special-status plant and wildlife species.** |

#### *Impact Analysis*

An impact to special-status plant and wildlife species would be considered significant if project operations resulted in a substantial, adverse change in any of the physical conditions (such as habitat) within the area affected by the project. Each potential special-status species that has the potential to be impacted from project operations is discussed in detail below.

*Special-status Plant Species*

As discussed above in section 3.3.2 above, several individual Congdon's tar plants (*Centromadia parryi* ssp. *congdonii*) were observed during an LOA reconnaissance survey in 2012. However, subsequent surveys conducted between 2014 and 2017 did not result in species observations, although not all of the subsequent surveys were conducted during the plants' blooming period. A follow-up focused survey was conducted in June 2018 and findings from the survey were negative for the occurrence of Congdon's tarplant.

Potential habitat for one other special-status species, big tarplant (*Blepharizonia* plumose), is also present on the project site. LOA has scheduled a follow up focused survey for big tarplant for late summer or fall 2018. All remaining special-status plant species have been determined unlikely to occur on-site based upon the results of the species review, habitat present, and the reconnaissance-level field assessment. Implementation of Mitigation Measure (MM)-BIO 1a would reduce potential impacts to Congdon's tar plant and big tarplant to a less than significant level by requiring pre-construction focused surveys, and if species are found to be present, implementation of avoidance, preservation, or off-site mitigation to be completed prior to any work taking place.

*Special-status Wildlife Species*

As discussed in Section 3.3.2 above, 10 special-status wildlife species have potential to occur on the project site. Table 2 of the BRA (Appendix C) provides both the habitat description and the rationale of the potential of special-status wildlife species to occur on the project site. Potential impacts to special-status wildlife species are detailed below.

**California tiger salamander**

The project site is located within the known range of the California tiger salamander (CTS) but outside of its critical habitat as designated by the USFWS. The CTS is a federally listed endangered species and therefore protected pursuant to the FESA. As noted in Section 3.3.3 above, FESA prohibits the "take" of endangered or threatened wildlife species.

Aestivation habitat utilized by CTS during the non-breeding season is typically limited to small mammal burrows and other refuges in grasslands and oak woodland within 1 mile of seasonal water sources. As noted above, no suitable breeding habitat is present on the site, as seasonal wetlands lack a suitable hydrologic regime for this species. CTS have the potential to migrate to breeding ponds during rain events or occupy upland underground refugia within the project site. Five ponds and wetlands on conservation areas within 1.2 miles to the east and south of the adjacent Callippe Golf Course support CTS breeding in ponds, wetlands, and at least one seep (Marcia Grefsrud; CDFW personal communication). The closest of these breeding ponds is 0.31 mile east of the proposed project site. Therefore, it is possible that CTS estivate on the project site. No focused surveys were conducted for this species, and it was not found during LOA's field surveys. However, 14 recorded occurrences of this species are within 3 miles of the project site. Although the development area is considered marginal estivation habitat, should CTS estivate on the project site during construction, individual CTS have the potential be injured or killed by activities; as such, there is moderate potential for this species to occur on the project site.

Implementation of MM BIO-1b would reduce potential impacts to the CTS to a less than significant level by avoiding construction during the wet season to the extent feasible, by requiring surveys for this species prior to beginning work, requiring worker training, and requiring revegetation following completion of construction activities. Consultation with USFWS would also occur in accordance with applicable requirements.

**Burrowing owl**

The burrowing owl is a California state species of special concern. This species typically occurs in the Central and Imperial Valleys, primarily utilizing ground squirrel burrows and other animals (e.g., badgers, prairie dog, and kangaroo rat). Suitable roosting and breeding habitat (open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation, grazing and agricultural lands) is not present in the proposed project area. No recorded occurrences of this species are within 3 miles of the site. However, in the event ground squirrels colonize the site prior to construction, there is potential for burrowing owl to roost and nest on the site from February to August, and potentially overwinter. Implementation of MM BIO-1c would reduce impacts to burrowing owl to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season, and if necessary, buffer zones established by a qualified biologist.

**American badger**

The American badger is a California state species of special concern. American badgers are mainly nocturnal and occupy burrows for concealment, protection from weather, and natal denning. The species occupy burrows in treeless areas such as prairies, grass-dominated meadows and fields within forests, and shrub-steppe communities (CNDDB 2016). There is suitable habitat for this species within locations in grassland and rangeland areas. It is possible that badgers may occur on-site during movements between surrounding habitats or for foraging opportunities. However, based on the lack of occurrences within 3 miles the site, there is low potential for this species to occur on the project site. Implementation of MM BIO-1d would reduce potential impacts to the American badger to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season, and if necessary, buffer zones established by a qualified biologist.

**Grasshopper sparrow**

The grasshopper sparrow is a California state species of special concern. This species will nest at the base of a clump of grasses or forbs in a slight depression on the ground (CWHRS 2008). Primarily insectivorous, grasshopper sparrows forage on invertebrates, forb seeds, and grasses. Suitable nesting and foraging habitat (dry, dense grasslands with a variety of tall forbs and scattered shrubs) is present on the project site. Although there are no recorded occurrences of this species within 3 miles of the project site, there is moderate potential for this species to occur. Implementation of MM BIO-1e would reduce impacts to grasshopper sparrows to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season, and if necessary, buffer zones established by a qualified biologist.

**Northern harrier**

The northern harrier is a California state species of special concern. This species is most commonly found nesting from sea level to 5,700 feet in meadows, grasslands, open rangeland, desert sinks, and fresh and saltwater emergent wetland. Northern harriers feed on small mammals, birds, amphibians, reptiles, crustaceans, and invertebrates (CWHRS 2008). Suitable nesting and foraging habitat is present on the project site. Although there are no recorded occurrences of this species within 3 miles of the project site and it was not found during field surveys, there is low potential for this species to occur. Implementation of MM BIO-1e would reduce potential impacts to northern harriers to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season, and if necessary, buffer zones established by a qualified biologist.

**Pallid bat**

The pallid bat is a California state species of special concern. The project site lacks suitable roosting habitat because of a lack of caves, rock outcroppings, or buildings; however, the presence of suitable foraging habitat on the northern boundary of the project site provides potential for this species to occur. Although there are no recorded occurrences of this species within 3 miles of the project site, and it was not found during field surveys there is low potential for this species to occur. Implementation of MM BIO-1e would reduce potential impacts to pallid bats to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season and, if necessary, buffer zones established by a qualified biologist.

**Townsend's big-eared bat**

The Townsend's big-eared bat is a California state species of special concern. Hibernating roost and maternity roost sites for this species include caves, mines, tunnels, buildings, and other man-made structures (CWHRS 2000). The hibernating period is November through February, and the maternity period lasts from April through mid-September. Townsend's big-eared bat is also known to utilize very-large-diameter (greater than 100 inches diameter at breast height) hollow redwoods for day roosts and temporary night roosts (Gellman and Zielinski 1996); however, no redwoods of this size occur within or directly adjacent to any of the work sites. One recorded occurrence of this species is located within 3 miles of the project site. Although the species was not found during field surveys, there is low potential for this species to occur. Implementation of MM BIO-1e would reduce potential impacts to Townsend's big-eared bat to a less than significant level by requiring pre-construction surveys prior to any work taking place during the nesting season and, if necessary, buffer zones established by a qualified biologist.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM BIO-1a Focused surveys for Congdon's tar plant and big tarplant**

A. LOA shall conduct focused surveys for the abovementioned species during the summer of 2018. If the focused surveys confirm that these species are absent from the impacted areas of the site, then mitigation would not be required. If the focused surveys confirm that these species are present in the impacted areas of the site, then the following measures shall be implemented to ensure that impacts are reduced to a less than significant level:

B. In consultation with a qualified botanist or plant ecologist, and to the maximum extent feasible, the project will be designed to avoid substantial direct and indirect impacts to these species. If the project cannot be designed to avoid significant impacts to these plant species, then the following compensatory measures will be implemented:

C. On-site preservation—The on-site proposed open space area should be surveyed during the appropriate blooming season to determine whether populations of the species being significantly impacted by the project are also present within areas that will be preserved. If populations of the species are present on the preservation area, it should be determined by a qualified botanist or plant ecologist whether these populations to be preserved would adequately compensate, or partially compensate, for lost populations on the project site. If it is determined that preserved populations would completely compensate for impacted populations, then no further compensation would be required. However, if it is determined that populations of the impacted species are absent from the site, or that they are present but their preservation would only partially mitigate for lost populations, then additional mitigation measures described below will be implemented.

D. Off-site mitigation—Mitigation for impacted plant species could be accommodated through restoration or preservation at an off-site location. The mitigation site must be confirmed to support populations of the impacted species and must be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar preservation mechanism. A qualified botanist or plant ecologist should prepare a Preservation Plan for the site containing at a minimum the following elements:
   - A monitoring plan and performance criteria for the preserved plant population
   - A description of remedial measures to be performed in the event that performance criteria are not met
   - A description of maintenance activities to be conducted on the site, including weed control, trash removal, irrigation, and control of herbivory by livestock and wildlife
E. The project applicant will be responsible for funding the development and implementation of any on-site or off-site preservation plan

**MM BIO-1b California tiger salamander (CTS)**

As stated in section 3.3.2, CTS have been formerly documented breeding in ponds within 1.5 miles of the project site. Because of the prior presence of CTS within 1.5 miles of the project site, the following mitigation measures are recommended.

A. A qualified biologist will conduct preconstruction surveys prior to ground breaking activities. If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFW approved relocation site by a qualified biologist.
B. Prior to the start of construction, a qualified biologist will train all construction personnel regarding habitat sensitivity, identification of special status species potentially occurring on the site, and required practices. A representative shall be appointed by the applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a CTS or who finds a dead, injured or entrapped individual. The representative shall be identified during the tailgate/training session. The representative's name and telephone number shall be provided to the Service prior to the initiation of ground disturbance activities.
C. A Service-approved biologist should be present for ground disturbing activities. The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CTS from moving into these areas. Construction activities should be limited to the period from May 1 through October 31.
D. Because dusk and dawn are often the times when CTS are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise. Construction personnel will inspect open trenches in the morning and evening for trapped amphibians. No canine or feline pets or firearms (except for federal, state, or

local law enforcement officers and security personnel) shall be permitted at the project site to avoid harassment, killing, or injuring of CTS.

E. To minimize harm or mortality to individual CTS during migration movements, a maximum speed limit of 10 mph for vehicle traffic on the project site during both construction and operation phases will be enforced.

**MM BIO-1c Burrowing owl**

A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified biologist to conduct a preconstruction survey on the project site. The survey shall establish the presence or absence of western burrowing owl and/or habitat features, and evaluate use by owls in accordance with CDFW survey guidelines.

B. On the parcel where the activity is proposed, the biologist shall survey the proposed disturbance footprint and a 500-foot radius from the perimeter of the proposed footprint to identify burrows and owls. Adjacent parcels under different land ownership need not be surveyed. The survey shall take place near the sunrise or sunset in accordance with CDFW guidelines. All burrows or burrowing owls shall be identified and mapped. During the breeding season (February 1–August 31), surveys shall document whether burrowing owls are nesting on or directly adjacent to disturbance areas. During the non-breeding season (September 1–January 31), surveys shall document whether burrowing owls are using habitat on or directly adjacent to any disturbance area. Survey results will be valid only for the season during which the survey is conducted.

C. If burrowing owls are not discovered, further mitigation is not required. If burrowing owls are observed during the pre-construction surveys, the applicant shall perform the following measures to limit the impact on the burrowing owls:

1. Avoidance shall include establishment of a 160-foot non-disturbance buffer zone. Construction may occur during the breeding season if a qualified biologist monitors the nest and determines that the birds have not begun egg-laying and incubation, or that the juveniles from the occupied burrows have fledged. During the non-breeding season (September 1–January 31), the project proponent shall avoid the owls and the burrows they are using, if possible. Avoidance shall include the establishment of a 160-foot non-disturbance buffer zone.
2. If it is not possible to avoid occupied burrows, passive relocation shall be implemented. Owls shall be excluded from burrows in the immediate impact zone and within a 160-foot buffer zone by installing one-way doors in burrow entrances. These doors shall be in place for 48 hours prior to excavation. The project area shall be monitored daily for 1 week to confirm that the owl has abandoned the burrow. Whenever possible, burrows should be excavated using hand tools and refilled to prevent re-occupation. Plastic tubing or a similar structure shall be inserted in the tunnels during excavation to maintain an escape route for any owls inside the burrow.

**MM BIO-1d American badger**

A. No more than 30 days prior to the first ground-disturbing activities, the project Applicant shall retain a qualified wildlife biologist to conduct a focused survey for the American badger to determine presence or absence of this species within a 300-foot radius of the disturbance area. If the species if observed within the project site during the focused survey, CDFW shall be contacted and any construction activities within the disturbance area must be delayed until an appropriate course of action can be established and approved by CDFW.
B. Before any activities begin on the project, an approved biologist will conduct a worker's environmental awareness program (WEAP) for all construction personnel. At a minimum, the training will include a description of the red-bellied newt and its habitat, the specific measures that are being implemented to conserve the American badger for the current project, and the boundaries within which the project may be accomplished. Brochures, books, and briefings may be used in the WEAP, provided that a qualified person is on hand to answer any questions.
C. If an active badger den is identified during pre-construction surveys within or immediately adjacent to any impacted areas, a construction-free buffer of up to 300 ft. (or distance specified by the resource agencies, such as CDFW) will be established around the den. A qualified biological monitor should be present on the site during project development activities to ensure the buffer is adequate to avoid direct impact to individuals or den abandonment, and determine that young are of an independent age.
D. The number of access routes, size of staging areas, and the total area of the activity will be limited to the minimum necessary to implement the project. Environmentally Sensitive Areas will be established to confine access routes and construction areas to the minimum area necessary to complete construction, and minimize the impact to American badger habitat; this goal includes locating access routes and construction areas outside of riparian areas to the maximum extent practicable.

**MM BIO-1e Migratory and nesting birds and bats**

A. Implementation of the following avoidance and minimization measures would avoid or minimize potential effects to migratory birds and habitat in and adjacent to the project site. These measures shall be implemented for construction work during the nesting season (February 15 through August 31).
B. If construction or tree removal is proposed during the breeding/nesting season for migratory birds (typically February 15 through August 31), a qualified biologist shall conduct pre-construction surveys for northern harrier, grasshopper sparrow, pallid bat, Townsend's big-ear bat, and other migratory birds within the construction area, including a 300-foot survey buffer, no more than 3 days prior to the start of ground-disturbing activities in the construction area.

C. If an active nest is located during pre-construction surveys, USFWS and/or CDFW (as appropriate) shall be notified regarding the status of the nest. Furthermore, construction activities shall be restricted as necessary to avoid disturbance of the nest until it is abandoned or a qualified biologist deems disturbance potential to be minimal. Restrictions may include establishment of exclusion zones (no ingress of personnel or equipment at a minimum radius of 300 feet around an active raptor nest and 50-foot radius around an active migratory bird nest) or alteration of the construction schedule.
D. A qualified biologist shall delineate the buffer using nest buffer signs, ESA fencing, pin flags, and or flagging tape. The buffer zone shall be maintained around the active nest site(s) until the young have fledged and are foraging independently.

### *Level of Significance After Mitigation*

Less than significant impact.

## Sensitive Natural Communities or Riparian Habitat

**Impact BIO-2: The project may have adverse impacts on sensitive natural communities or riparian habitat.**

### *Impact Analysis*

As discussed in Section 3.3.2, the vast majority of the project site is made up of agricultural/ rangeland with small areas of seasonal wetlands and intermittent drainages. There is no riparian habitat on the site. The drainages found on the project site are all contained in the preserved open space area of the site and would not be affected by implementation of the project. Impacts relating to seasonal wetlands are discussed in detail within Impact BIO-3 below. The proposed project would not have a substantial adverse effect on sensitive natural communities or riparian habitat. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Wetlands and Jurisdictional Features

**Impact BIO-3: The proposed project may have a substantial adverse effect on wetlands or jurisdictional features.**

As discussed above in Section 3.3.2, jurisdictional seasonal wetlands occur within the project site. All wetlands on the project site, whether isolated or not, are considered jurisdictional by the

RWQCB. Slope stabilization occurring within the open space area will impact one of these wetlands (Isolated Seasonal Wetland 2; 0.02 acre). Trenching that would be required for a stormwater conveyance pipeline and the construction of an emergency vehicle access road would result in temporary and permanent impacts to one additional wetland (Seasonal Wetland 4; 0.02 acre temporary and 0.1 acre of permanent impacts). Project construction will result in impacts to the on-site wetland resources; as such, applications for Section 404 CWA Nationwide Permit and 401 Water Quality Certification permit shall be submitted to the USACE and RWQCB respectively, as required by MM BIO-3. Implementation of MM BIO-3 and compliance with the associated permits would reduce impacts from erosion, sedimentation, runoff, and accidental spills, as well as impacts to wetland habitat to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM BIO-3 Impacts to wetlands**

- The Applicant shall obtain a Section 404 Clean Water Act (CWA) permit for impacts to waters of the United States. The Applicant shall also obtain a Section 401 permit from the Regional Water Quality Control Board (RWQCB). These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project.
- The Applicant shall ensure that the project will result in no net loss of waters of the U.S. by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits.
- Compensatory mitigation may consist of (1) obtaining credits from a mitigation bank; (2) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities; and/or (3) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This final type of compensatory mitigation may be provided at or adjacent to the impact site (on-site mitigation) or at another location, usually within the same watershed as the permitted impact (off-site mitigation). The project/permit Applicant retains responsibility for the implementation and success of the mitigation project.
- Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project.

### *Level of Significance After Mitigation*

Less than significant impact.

## Fish and Wildlife Movement Corridors

**Impact BIO-4: The project may have substantially adverse impacts on fish or wildlife movement.**

The project site was evaluated for evidence of a wildlife movement corridor during the reconnaissance-level survey. The subsequent conclusions are based on the information compiled during the literature review, including aerial photographs, USGS topographic maps and resource maps for the vicinity, the field survey conducted, and professional knowledge of desired topography and resource requirements for wildlife potentially utilizing the project site and vicinity. The following policy is identified in the Pleasanton General Plan regarding the protection of biological resources as they relate to wildlife movement corridors:

- **Policy 1:** Preserve and enhance natural wildlife habitats and wildlife corridors
  - **Program 1.1:** Complete a comprehensive study of the ecosystems and wildlife habitat areas within and around the Planning Area, and develop and implement ordinances and policies that will provide for their preservation and enhancement.
  - **Program 1.2:** Identify land within the Planning Area which could be reclaimed as viable wildlife habitat. Study methods to re-establish viable plant and animal communities in these areas. Develop standards to accomplish habitat reclamation which: (1) specify the minimum acreage, topography, flora, fauna, and other characteristics necessary to ensure survival of wildlife habitat areas; (2) specify necessary length, breadth, flora, fauna, and other characteristics necessary to ensure the protection and use of wildlife corridors; and (3) prevent the creation of open space islands, unless they are connected through a series of viable wildlife corridors in accordance with specified standards.
  - **Program 1.3:** Preserve and enhance the resource value of wetlands through project development design measures. These measures should be based in part on jurisdictional wetlands delineation in accordance with current Army Corps of Engineers criteria, for projects which are known to have or that may have wetlands present within their boundaries.
  - **Program 1.4:** Develop and implement ordinances and policies that provide for the preservation of wildlife corridors, and establish mitigation requirements which minimize the barriers across wildlife corridors that roadways and developments can create.
  - **Program 1.5:** Investigate existing private, State, and federal incentive programs and develop City incentive programs that encourage property owners to cooperate in the preservation and restoration of wildlife habitat.
  - **Program 1.6:** Analyze potential impacts on wildlife populations and habitats before developing projects, using the California Environmental Quality Act (CEQA) process or other processes, as relevant.
  - **Program 1.8:** Design site sensitive recreation or interpretive facilities to minimize intrusion within natural public open space. Limit public access, including hiking trails, into sensitive habitat area, when warranted.
  - **Program 1.9:** Plant native species wherever possible in public and private landscaping, and provide wildlife habitat in new landscaping, where appropriate.
  - **Program 1.10:** Design storm retention and drainage ponds, groundwater-recharge areas, and watercourse as wildlife habitats, when appropriate and environmentally sound.

- **Program 1.12:** Support appropriate development intensity adjacent to areas designated as Wildlands Overlay.

The project site contains agricultural/rangeland, and the surrounding area consists of residential, light commercial, and agricultural uses. As noted in the discussion under Impact BIO-1, special-status wildlife species and bird species protected under the Fish and Game Code and MBTA have the potential to occur within project site and may support the movement of these species within the larger Pleasanton Watershed. These species include CTS, burrowing owl, grasshopper sparrow, northern harrier, American badger, pallid bat, and Townsend's big-eared bat. Compliance with MMs BIO-1a to BIO-1e, and with federal and state regulations related to the protection of migratory fish and wildlife species, including proposed General Plan 2035 Policy 1 that protects biological resources, would reduce impacts to these species to less than significant.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement MMs BIO-1a to BIO-1e.

### *Level of Significance After Mitigation*

Less than significant impact.

## Local Policies or Ordinances and Conservation Plans

| | |
|---|---|
| **Impact BIO-5:** | **The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and it would not conflict with an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.** |

Implementation of the project would not result in a conflict with the local policies or ordinances outlined in Section 3.3.3 above that aim to protect biological resources. Furthermore, no trees occur within the areas that will be impacted by the project or by slope stabilization techniques. Furthermore, the City of Pleasanton does not have an adopted Habitat Conservation Plan or Natural Community Conservation Plan, nor are there any other approved local, regional, or state habitat conservation plan that would conflict with the proposed project. As such, the project would not conflict with any local policies or ordinances that protect biological resources and impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

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# 3.4 - Cultural Resources

## 3.4.1 - Introduction

This section describes the existing cultural resources setting and potential effects from project implementation on the site and its surrounding area that are based on a Phase I Cultural Resource Assessment (PI CRA), prepared by FirstCarbon Solutions (FCS) in January, 2018. This report is available in Appendix D, Cultural Resources Report.

## 3.4.2 - Environmental Setting

### Overview

The term "cultural resources" encompasses historic, archaeological, and paleontological resources, and burial sites. Below is a brief summary of each component:

- **Historic Resources:** Historic resources are associated with the recent past. In California, historic resources are typically associated with the Spanish, Mexican, and American periods in the State's history and are generally less than 200 years old.
- **Archaeological Resources:** Archaeology is the study of prehistoric human activities and cultures. Archaeological resources are generally associated with indigenous cultures.
- **Paleontological Resources:** Paleontology is the study of plant and animal fossils.
- **Burial Sites:** Burial sites are formal or informal locations where human remains, usually associated with indigenous cultures, are interred.

### Cultural Setting

Following is a brief overview of the prehistory, ethnography, and historic background, providing a context in which to understand the background and relevance of sites found in the general project area. This section is not intended to be a comprehensive review of the current resources available; rather, it serves as a general overview. Further details can be found in ethnographic studies, mission records, and major published sources.

#### *Prehistory*

Early archaeological investigations in California were conducted at sites located in the Sacramento-San Joaquin Delta region. The first published account documents investigations in the Lodi and Stockton area (Schenck and Dawson 1929). The initial archaeological reports typically contained descriptive narratives, with more systematic approaches sponsored by Sacramento Junior College in the 1930s. At the same time, University of California at Berkeley excavated several sites in the lower Sacramento Valley and Delta region, which resulted in recognizing archaeological site patterns based on variations of inter-site assemblages. Research during the 1930s identified temporal periods in central California prehistory and provided an initial chronological sequence (Lillard and Purves 1936; Lillard et al. 1939). In 1939, Lillard noted that each cultural period led directly to the next and that influences spread from the Delta region to other regions in central California (Lillard et al. 1939). In the late 1940s and early 1950s, Beardsley documented similarities in artifacts among sites in the San Francisco Bay region and

the Delta and refined his findings into a cultural model that ultimately became known as the Central California Taxonomic System (CCTS). This system proposed a uniform, linear sequence of cultural succession (Beardsley 1948 and 1954). The CCTS system was challenged by Gerow, whose work looked at radiocarbon dating to show that Early and Middle Horizon sites were not subsequent developments but, at least partially, contemporaneous (1954; 1974; Gerow with Force 1968).

To address some of the flaws in the CCTS system, Fredrickson (1973) introduced a revision that incorporated a system of spatial and cultural integrative units. Fredrickson separated cultural, temporal, and spatial units from each other and assigned them to six chronological periods: Paleo-Indian (10000 to 6000 B.C.); Lower, Middle and Upper Archaic (6000 B.C. to A.D. 500), and Emergent (Upper and Lower, A.D. 500 to 1800). The suggested temporal ranges are similar to earlier horizons, which are broad cultural units that can be arranged in a temporal sequence (Moratto 1984). In addition, Fredrickson defined several patterns—a general way of life shared within a specific geographical region. These patterns include:

- Windmiller Pattern or Early Horizon (3000 to 1000 B.C.)
- Berkeley Pattern or Middle Horizon (1000 B.C. to A.D. 500)
- Augustine Pattern or Late Horizon (A.D. 500 to historic period)

Brief descriptions of these temporal ranges and their unique characteristics follow.

*Early Horizon or Windmiller Pattern (3000 to 1000 B.C.)*

Characterized by the Windmiller Pattern, the Early Horizon was centered in the Cosumnes district of the Delta and emphasized hunting rather than gathering, as evidenced by the abundance of projectile points in relation to plant processing tools. Additionally, atlatl, dart, and spear technologies typically included stemmed projectile points of slate and chert but minimal obsidian. The large variety of projectile point types and faunal remains suggests exploitation of numerous types of terrestrial and aquatic species (Bennyhoff 1950; Ragir 1972). Burials occurred in cemeteries and intra-village graves. These burials typically were ventrally extended, although some dorsal extensions are known with a westerly orientation and a high number of grave goods. Trade networks focused on acquisition of ornamental and ceremonial objects in finished form rather than on raw material. The presence of artifacts made of exotic materials such as quartz, obsidian, and shell indicates an extensive trade network that may represent the arrival of Utian populations into central California. Also indicative of this period are rectangular *Haliotis* and *Olivella* shell beads, and charmstones that usually were perforated.

*Middle Horizon or Berkeley Pattern (1000 B.C. to A.D. 500)*

The Middle Horizon is characterized by the Berkeley Pattern, which displays considerable changes from the Early Horizon. This period exhibited a strong milling technology represented by minimally shaped cobble mortars and pestles, although metates and manos were still used. Dart and atlatl technologies during this period were characterized by non-stemmed projectile points made primarily of obsidian. Fredrickson (1973) suggests that the Berkeley Pattern marked the eastward expansion of Miwok groups from the San Francisco Bay Area. Compared with the Early Horizon, there is a higher proportion of grinding implements at this time, implying an emphasis on plant resources rather than on hunting. Typical burials occurred within the village with flexed positions, variable cardinal orientation, and some

cremations. As noted by Lillard, the practice of spreading ground ochre over the burial was common at this time (Lillard et al. 1939). Grave goods during this period are generally sparse and typically include only utilitarian items and a few ornamental objects. However, objects such as charmstones, quartz crystals, and bone whistles occasionally were present, which suggest the religious or ceremonial significance of the individual (Hughes 1994). During this period, larger populations are suggested by the number and depth of sites compared with the Windmiller Pattern. According to Fredrickson (1973), the Berkeley Pattern reflects gradual expansion or assimilation of different populations rather than sudden population replacement and a gradual shift in economic emphasis.

*Late Horizon or Augustine Pattern (A.D. 500 to Historic Period)*

The Late Horizon is characterized by the Augustine Pattern, which represents a shift in the general subsistence pattern. Changes include the introduction of bow and arrow technology; and most importantly, acorns became the predominant food resource. Trade systems expanded to include raw resources as well as finished products. There are more baked clay artifacts and extensive use of Haliotis ornaments of many elaborate shapes and forms. Burial patterns retained the use of flexed burials with variable orientation, but there was a reduction in the use of ochre and widespread evidence of cremation (Moratto 1984). Judging from the number and types of grave goods associated with the two types of burials, cremation seems to have been reserved for individuals of higher status, whereas other individuals were buried in flexed positions. Johnson (1976) suggests that the Augustine Pattern represents expansion of the Wintuan population from the north, which resulted in combining new traits with those established during the Berkeley Pattern.

Central California research has expanded from an emphasis on defining chronological and cultural units to a more comprehensive look at settlement and subsistence systems. This shift is illustrated by the early use of burials to identify mortuary assemblages and more recent research using osteological data to determine the health of prehistoric populations (Dickel et al. 1984). Although debate continues over a single model or sequence for central California, the general framework consisting of three temporal/cultural units is generally accepted, although the identification of regional and local variation is a major goal of current archaeological research.

*Regional Investigations*

The majority of previous investigations in the lower Sacramento Valley have been conducted east of the Sacramento River, typically along the Cosumnes River. Two investigations that focused on the lower Sacramento Valley are CA-SAC-133 (Bouey and Waechter 1992) and CA-SAC-16 (Derr 1983), among others. Pertinent to the proposed project is CA-SOL-363 (Rosenthal and White 1994) located in Dixon, which documented 15 features and 39 burials. The assemblage included projectile points, primarily lanceolate forms, manufactured from obsidian found in Napa Valley, which are typically associated with the Berkeley Pattern. The predominant type of shell beads were *Olivella*, Class F2a, F2b, F3b, G5, and C3, which were attributed to the Intermediate Phase of the Middle Period. The lack of Augustine Pattern components is indicated by the absence of Olivella Class M shell beads and clamshell disk beads (Rosenthal and White 1994). The paucity of milling tools in relation to projectile points suggests that subsistence strategies relied on hunting rather than vegetal resources. The analyzed faunal remains indicated that the site was used seasonally as a winter camp.

Consistent with Berkeley Pattern burial practices, burials at the site were flexed with variable cardinal orientation. No cremations were reported at the site.

### *Native American Background*

*The Ohlone (Coastanoan)*

At the time of European contact, the project vicinity was occupied by various tribelets that were part of the Ohlone (previously Costanoan) tribe of California Native Americans (Levy 1978). The Ohlone group designates a language family consisting of eight branches of the Ohlone language that are considered too distinct to be dialects, wherein each is related to its geographically adjacent neighbors. These groups lived in approximately 50 separate and politically autonomous tribelet areas, each with one or more permanent villages, between the North San Francisco Bay and the lower Salinas River (Levy 1978).

The arrival of Ohlone groups into the Bay Area appears to be temporally consistent with the appearance of the Late Period artifact assemblage in the archaeological record, as documented at sites south of the project area such as the Emeryville Shellmound or the Ellis Landing Shellmound. It is probable that the Ohlone moved south and west from the delta region of the San Joaquin-Sacramento River into the Bay Area during the Late Prehistoric.

At the time of Spanish arrival, the Pelnen tribe of Ohlones/Costanoans inhabited the general project area vicinity and another smaller group, the Causen, were located in Sunol Valley. These two groups were intermarried and possibly part of a larger tribe in the Pleasanton/Sunol area villages (Clark 2015). The project area vicinity was permanently occupied with small permanent and seasonally occupied villages at the time. The project region was used aboriginally for habitation and specific locales for specific tasks, such as gathering and processing food resources.

The various Ohlone tribes subsisted as hunter-gatherers and relied on local terrestrial and marine flora and fauna for subsistence (Levy 1978). The predominant plant food source was the acorn, but they also exploited a wide range of other plants, including various seeds, buckeye, berries, and roots. Protein sources included grizzly bear, elk, sea lions, antelope, and black-tailed deer as well as smaller mammals such as raccoon, brush rabbit, ground squirrels, and wood rats. Waterfowl, including Canadian geese, mallards, green-winged teal, and American widgeon, were captured in nets using decoys to attract them. Fish also played an important role in the Ohlone diet and included steelhead, salmon, and sturgeon (Jones 2007). Like other native Californians, the Ohlone managed their environment to improve it for their use. For example, the Ohlone burned grass and brush lands annually in order to improve productivity of forage habitat for deer and rabbits and safety by keeping the land open with clear sight lines to better spot predators or neighbors.

The Ohlone constructed watercraft from tule reeds and possessed bow and arrow technology. They fashioned blankets from sea otter pelts, fabricated basketry from twined reeds of various types, and assembled a variety of stone and bone tools in their assemblages. Ohlone villages typically consisted of domed dwelling structures, communal sweathouses, dance enclosures, and assembly houses constructed from thatched tule reeds and a combination of wild grasses, wild alfalfa, and ferns.

The Ohlone were politically organized into autonomous tribelets that had distinct cultural territories. Individual tribelets contained one or more villages with a number of seasonal camps for resource procurement within the tribelet territory. The tribelet chief could be either male or female, and the position was inherited patrilineally, but approval of the community was required. The tribelet chief and council were essentially advisors to the community and were responsible for feeding visitors, directing hunting and fishing expeditions, ceremonial activities, and warfare on neighboring tribelets.

The Gold Rush brought disease to the native inhabitants, and by the 1850s, nearly all of the Ohlone had adapted in some way or another to economies based on cash income. Hunting and gathering activities continued to decline and were rapidly replaced with economies based on ranching and farming (Levy 1978).

### *Historic Background*

The history of northern California can be divided into several periods of influence; pertinent historic periods are briefly summarized below.

#### *Spanish and Mexican Period*

Spanish exploration into the Central Valley dates back to the late 1700s. Spanish mission records indicate that by 1800, Costanoan speaking peoples, and other villages were being taken to Mission Dolores, and that Mission Sonoma, built in 1823, was baptizing tribal members until secularization of the missions in 1833. Many Native Americans were not willing converts: there are numerous accounts of neophytes fleeing the missions, and a series of "Indian Wars" broke out when the Spanish tried to return them to the missions (Johnson 1978). During this period, Native American populations were declining rapidly because of an influx of Euro-American diseases. In 1832, a party of trappers from the Hudson's Bay Company, led by John Work, traveled down the Sacramento River, unintentionally spreading a malaria epidemic to Native Californians. Four years later, a smallpox epidemic decimated local populations. (Cook 1955).

The Mexican Period, 1821 to 1848, was marked by secularization and division of mission lands among the *Californios* as land grants, termed ranchos. During this period, Mariano G. Vallejo assumed authority of Sonoma Mission and established a friendly relationship with the Native Americans who were living there. In particular, Vallejo worked closely with Chief Solano, a Patwin who served as Vallejo's spokesperson when problems with Native American tribes arose. The large rancho lands often were worked by Native Americans who were used as forced labor.

#### *The Gold Rush and American Expansion*

In 1848, James W. Marshall discovered gold at Coloma in modern-day El Dorado County, which started the gold rush into the region that forever altered the course of California's history. The arrival of thousands of gold seekers in the territory contributed to the exploration and settlement of the entire state. By late 1848, approximately four out of five men in California were gold miners (Robinson 1948). The gold rush originated along the reaches of the American River and other tributaries to the Sacramento River, and Hangtown, present-day Placerville, became the closest town offering mining supplies and other necessities for the miners in El Dorado County. Gold was subsequently found in the tributaries to the San Joaquin River, which flowed north to join the Sacramento River in the great delta east of San Francisco Bay.

As mining spread, mining techniques changed. Initially, miners relied on gold panning in a shallow pan until the heavier, gold-bearing materials fell to the bottom while the water and lighter sand spilled out over the rim. This technique was displaced by simple mining machines like the wooden "rocker" into which pails of water were emptied and processed at one time. The gold in and around stream beds was soon exhausted, and hard-rock mining took over, digging shafts up to 40 feet deep with horizontal tunnels radiating from these shafts in search of subterranean veins of gold-bearing quartz (VSFWM 2006).

By 1864, California's gold rush had essentially ended. The rich surface and river placers were largely exhausted and the miners either returned to their homelands or stayed to start new lives in California. After the gold rush, people in towns such as Jackson, Placerville, and Sonora turned to other means of commerce, such as ranching, agriculture, and timber production. With the decline of gold mining, agriculture and ranching came to the forefront in the State's economy. California's natural resources and moderate climate proved well suited for cultivation of a variety of fruits, nuts, vegetables, and grains (Beck and Haase 1974).

### *Local History*

*Alameda County*

Alameda County occupies the eastern portion of the East Bay region of the San Francisco Bay Area region. The county was formed in March of 1853 from portions of Contra Costa and Santa Clara counties. Alameda County, like much of California, was seen as a land of economic opportunity, not just for its mining resources but also for its productive land where farmers could cultivate a variety of crops. Agriculture became important in the California economy in the late 1850s, and through to the 1860s, homesteading became a means by which people could own and operate a family farm. The decidedly agricultural focus also underpins the historical significance of the Spanish colonial and Mexican era of land grants. The variety of cultural traditions, technological developments, and ideological views further underwrite the County's agricultural history. The County's rural setting continues to support farming and ranching operations.

As early as 1887, special interests advertised the County's virtues as a place to cultivate. Early settlers began to speak of beneficial soils that support a range of crops—oranges, lemons, olives, pomegranates, figs, and grapes flourished—with seasonal rainfall, and suitable climates. In addition, the welcoming character of towns, regional accessibility, and schools further encouraged westward migration.

A variety of crops flourished in the County because of favorable sub-climate conditions. Cultivated lands expanded with changes and advancements in the agricultural industry that encouraged farmers to adapt operations and remain relevant. More generally, stable crops such as wheat and specialty crop agriculture were an important component of California's agricultural history. Between 1880 and 1900, for example, farmers shifted from apples to such fruits as peaches, plums, prunes, apricots, and pears. The shift boosted California's orchard industries, coinciding with accelerated growth in local drying and canning industries. The development of these specialized crops gave California an economic buffer when wheat prices declined in the early 20$^{th}$ century.

Large-scale commercial operations began to capitalize on mechanical innovations just as irrigation developed in the early 1880s. Consequently, competing economic interests caused land prices to increase and make family farming a less profitable enterprise. Following the world wars, large companies followed their employees to suburban areas east of San Francisco. The establishment of large population centers fostered the development of equally large shopping centers. To meet demand on infrastructure, the State modernized highways and roadways. With the establishment of the Bay Area Rapid Transit system, the central county cities turned to spawn their own suburbs. The once outlying rural areas of Antioch, Oakley, and Brentwood continue to grow.

*City of Pleasanton*

The City of Pleasanton transformed from a small stopover on the way to Gold Country in the early 1800s into a city of suburban character dominated by detached single-family homes. Since the 1980s, the City has been heavily redeveloped into a suburban community, and is located in the area east of the Bay Area and south of the Interstate-580. Pleasanton is approximately 25 miles east of Oakland, 5 miles north of Fremont, and 6 miles west of Livermore. The interstate is the main highway between the cities of Pleasanton and Livermore and also is the main route leading into the Cities of Oakland and San Francisco. In addition, Interstate 680 is located approximately 0.75 mile to the west. Major arterial roads include Sunol Boulevard, which lies to the east of Interstate 680, and Alisal Street, which runs in a north-south direction along the project site.

The City's history first started when Jose Amador created the first settlement in 1826, which was called Alisal. It was located on the lands of the Rancho Santa Rita near the site of an Indian ranchera, around the Francisco Solano Alviso Adobe, called El Alisal (The Sycamores). The City's modern history stems from the transcontinental railroad in 1869, which accelerated population growth and rapidly increased the economy. Pleasanton was incorporated in 1894 and by 1900 became a prosperous community. The City's Main Street became a center for business and offered the community a bank and several hotels. In 1930, Henry J. Kaiser created the hugely profitable gravel industry by realizing the potential of sand and gravel below the Amador Valley. However, by 1979 much of Pleasanton was redeveloped into homes, schools, and urban land uses. In 1982, the Hacienda Business Park kick-started corporate company growth and changed the City. Currently, Pleasanton is home to multinational corporations such as Oracle and is a mid-sized bedroom community (Pleasanton Chamber of Commerce 2010).

## 3.4.3 - Regulatory Framework

### Federal

#### *National Historic Preservation Act*

The National Historic Preservation Act of 1966 (NHPA), as amended, established the National Register of Historic Places (NRHP), which contains an inventory of the nation's significant prehistoric and historic properties. Under 36 CFR 60, a property is recommended for possible inclusion on the NRHP if it is at least 50 years old, has integrity, and meets one of the following criteria:

- It is associated with significant events in history, or broad patterns of events.
- It is associated with significant people in the past.

- It embodies the distinctive characteristics of an architectural type, period, or method of construction; or it is the work of a master or possesses high artistic value; or it represents a significant and distinguishable entity whose components may lack individual distinction.
- It has yielded, or may yield, information important in history or prehistory.

Certain types of properties are usually excluded from consideration for listing in the NRHP, but they can be considered if they meet special requirements in addition to meeting the criteria listed above. Such properties include religious sites, relocated properties, graves and cemeteries, reconstructed properties, commemorative properties, and properties that have achieved significance within the past 50 years.

## State

### *California Register of Historical Resources*

As defined by Section 15064.5(a)(3)(A-D) of the CEQA Guidelines, a resource shall be considered historically significant if the resource meets the criteria for listing on the California Register of Historical Resources (CR). The California Register of Historical Resources and many local preservation ordinances have employed the criteria for eligibility to the NRHP as a model, since the NHPA provides the highest standard for evaluating the significance of historic resources. A resource that meets the NRHP criteria is clearly significant. In addition, a resource that does not meet the NRHP standards may still be considered historically significant at a local or state level.

### *California Environmental Quality Act*

The California Environmental Quality Act (CEQA) Guidelines state that a resource need not be listed on any register to be found historically significant. The CEQA Guidelines direct lead agencies to evaluate archaeological sites to determine if they meet the criteria for listing in the California Register. If an archaeological site is a historical resource, in that it is listed or eligible for listing in the California Register, potential adverse impacts to it must be considered. If an archaeological site is considered not to be an historical resource but meets the definition of a "unique archeological resource" as defined in Public Resources Code Section 21083.2, then it would be treated in accordance with the provisions of that section.

## Local

### *County of Alameda*

*Chapter 17.62 Historic Preservation Ordinance*

- **17.62.020 Purpose**: The Purpose of the Ordinance shall be to:
  a) Identify, protect, and encourage the preservation of significant architectural, historic, prehistoric and cultural structures, sites, resources and properties in the County;
  b) Ensure the preservation, protection, enhancement and perpetuation of historic structures, sites and other resources to the fullest extent feasible;
  c) Encourage, through public or private action, the maintenance or rehabilitation of historic structures, sites and other resources;
  d) Safeguard the County's historic resources, both public and private projects;

e) Encourage development that sensitively incorporates the retention, preservation and re-use of historic structures, sites and other resources;
f) Foster civic pride in the character and quality of the County's historic resources and in the accomplishments of its people through history;
g) Provide a mechanism, through surveys, nominations and other available means, to compile, update and maintain a register of historic resources within the County;
h) Protect and enhance the County's attraction to tourists and visitors;
i) Provide for consistency with state and federal preservation standards, criteria and practices;
j) Encourage new development that will be aesthetically compatible with historic resources;
k) Make available incentive opportunities to preserve Alameda County's historic resources

- **17.62.060 Criteria and Requirements for Placement on the Alameda County Register**: The criteria and requirements for placement on, or deletion from, the Alameda County Register as landmarks, historic preservation districts, contributing resources or structures of merit are as follows:
  A. A nominated resource shall be added to the Alameda County Register as a landmark if the Board of Supervisors finds, after holding the hearings required by this chapter, that all of the requirements set forth below are satisfied:
     1. The nominated resource meets one or more of the following criteria:
        a. It is associated with events that have made a significant contribution to the broad patterns of the history of the County, the region, the state or the nation;
        b. It is associated with the lives of persons significant in the County's past;
        c. It embodies the distinctive characteristics of a type, period or method of construction;
        d. It represents the work of an important creative individual or master;
        e. It possesses high artistic values; or
        f. It has yielded, or may be likely to yield, information important in the prehistory or history of the County, the region, the state or the nation.
     2. The nominated resource has integrity of location, design, setting, materials, workmanship, feeling and association. Integrity shall be judged with reference to the particular criterion or criteria specified in subparagraph 1.
     3. The nominated resource has significance historically or architecturally, and its designation as a landmark is reasonable, appropriate and necessary to promote, protect and further the goals and purposes of this chapter.
     4. The nominated resource has been evaluated by a qualified historical resources consultant who meets one or more of the Secretary of the Interior's professional qualifications standards or who are certified by the Register of Professional Archaeologists, and the evaluator has submitted documents that provide evidence of the resources historical or architectural significance.
  B. A geographic area nominated as a historic preservation district shall be added to the Alameda County Register as a historic preservation district if the Board of Supervisors finds, after holding the hearings required by this chapter, that all of the requirements set forth below are satisfied:
     1. The area is a geographically definable area;

2. The area possesses either:
   a. A significant concentration or continuity of buildings unified by: a) past events; or b) aesthetically by plan or physical development; or
   b. The area is associated with an event, person, or period significant or important to County history
3. The designation of the geographic area as a historic preservation district is reasonable, appropriate and necessary to protect, promote and further the goals and purposes of this chapter and is not inconsistent with other goals and policies of the County.
4. A historic preservation district shall have integrity of location, design, setting, materials, workmanship, feeling and association.
5. The collective historic value of the buildings and structures in a historic preservation district taken together is greater than the historic value of each individual building or structure.
6. The application is accompanied by a form bearing the signatures of at least fifty-one percent (51 %) of all property owners within the area of the proposed district.
7. The Board finds that the addition of the district to the Register does not in any manner interfere, eliminate or otherwise obviate the identification, qualification, designation and preservation requirements of the creation of Historic Preservation Districts pursuant to Chapter 20 of this Title.

C. A nominated resource shall be added to the Alameda County Register as a structure of merit if the Board of Supervisors finds, after holding the hearing(s) required by this chapter, that it satisfies one or more of the following criteria:
   1. It represents in its location an established and familiar visual feature of the neighborhood, community or County; or
   2. It materially benefits the historic, architectural or aesthetic character of the neighborhood or area; or
   3. It is an example of a type of building that once was common but is now rare in its neighborhood, community or area; or
   4. It is connected with a business or use which was once common but is now rare; or
   5. It contributes to an understanding of the contextual significance of a neighborhood, community or area.

D. A nominated resource shall be added to the Alameda County Register as a contributing resource if the Board of Supervisors finds, after holding the hearing(s) required by this chapter, that it satisfies one or more of the following criteria:
   1. The nominated resource is within a historic district;
   2. The nominated resource either embodies the significant features and characteristics of the historic district or adds to the historical associations, historical architectural qualities or archaeological values identified for the historic district;
   3. The nominated resource was present during the period of historical significance of the historic district and relates to the documented historical significance of the historic district;
   4. The nominated resource either possesses historic integrity or is capable of yielding important information about the period of historical significance of the historic district; and

5. The nominated resource has important historic or architectural worth, and its designation as a contributing resource is reasonable, appropriate and necessary to protect, promote and further the goals and purposes of this chapter.

## 3.4.4 - Methodology

This section describes the existing cultural resources setting and potential effects from Project implementation on the Project site and its surrounding area. Analysis is based on information collected from record searches at the Northwest Information Center (NWIC), the Native American Heritage Commission (NAHC), The University of California Museum of Paleontology Database (UCMP), as well as additional archival research, pedestrian surveys and architectural assessments of properties over 50 years in age located within the project boundaries.

### Records Searches

#### *Northwest Information Center*

On February 15, 2018, FCS staff conducted a records search for the project area and a 0.5-mile radius beyond the project boundaries at the NWIC located at California State University Sonoma. To identify any historic properties or resources, the current inventories of the NR, the CR, the California Historical Landmarks list, the California Points of Historical Interest list, and the California State Historic Resources Inventory were reviewed to determine the existence of previously documented local historical resources. Results from the NWIC indicate that four resources have been recorded within 0.5 mile of the project area, none of which are located within the project area (Table 3.4-1). In addition, seven area-specific survey reports are on file with the NWIC for the search radius (Table 3.4-2). The previous surveys assessed the majority of the project location, suggesting the project area has largely been previously surveyed for cultural resources.

**Table 3.4-1: Cultural Resources within a 0.5-mile Radius of the Project Area**

| Resource No. | Resource Description | Date Recorded |
|---|---|---|
| P-01-000044 | **CA-ALA-000024: Prehistoric Site**<br>AP15 (Habitation) | 1950 |
| P-01-002157 | **878 Sycamore Road, House No. 1: Historic Building Site**<br>AH15 (House) | 1997 |
| P-01-002158 | **878 Sycamore Road, House No. 2: Historic Building Site**<br>AH15 (House) | 1997 |
| P-01-010573 | **Manning Barn: Historic Building**<br>HP33 (Farm/Ranch) | 2002 |
| Source: NWIC Records Search, February 15, 2018 | | |

**Table 3.4-2: Previous Investigations within a 0.5-mile Radius of the Project Area**

| Report Number | Report Title/Project Focus | Author | Date |
|---|---|---|---|
| S-008838 | Preliminary Cultural Resources Study for the Proposed Vineyard Substation and 230 kV Transmission Line Tap | John Holson | 1985 |
| S-011746 | Archaeological Field Inspection of the Proposed North Sycamore Specific Plan Area, Pleasanton, Alameda County, California (letter report) | Holman and Associates | 1990 |
| S-020727 | A Historical Resources Evaluation of 878 Sycamore Road (Parcel 18 of the North Sycamore Specific Plan Area), Pleasanton, Alameda County, California | William Roop | 1997 |
| S-020809 | Cultural Resources Assessment Report, Happy Valley Project Area, Pleasanton, Alameda County, California | Lori Harrington and Carrie D. Wills | 1998 |
| S-022867 | A Cultural Resources Evaluation of the Lund Ranch II Project, Pleasanton, California | Eric Strother and Amy McCarthy | 1999 |
| S-026576 | Manning Barn Documentation Alameda County, California | William Self Associates | 2002 |
| S-046680 | Archaeological Reconnaissance of the Spotorno Property project area in the city of Pleasanton, Alameda County, California | Matthew R. Clark | 2015 |
| Source: NWIC Records Search, February 15, 2018 | | | |

### *Native American Heritage Commission and Tribal Correspondence*

On January 30, 2018, FCS sent a letter to the NAHC in an effort to determine whether any sacred sites are listed on its Sacred Lands File for the project area. A response was received on March 1, 2018 indicating that the Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate project area. The NAHC included a list of six tribal representatives available for consultation. To ensure that all Native American knowledge and concerns over potential TCRs that may be affected by the project are addressed, a letter containing project information and requesting any additional information was sent to each tribal representative on March 6, 2018. No responses have been received to date.

### *Pedestrian Survey*

The project site is located within the USGS Livermore and Dublin 7.5 minute Quadrangle Map Township 3 South, Range 1 East Section 28 Latitude is 37°40’21”N 121°52’57”W. The 154-acre project site is located adjacent to Alisal Street and near 6656 Alisal Street, Pleasanton, CA in the City of Pleasanton, Alameda County, California. The project site consists of two parcels designated by APNs 940-0016-006 and 948-015-002-01.

A previous archeological reconnaissance of the Spotorno property was conducted as part of the previous EIR for a different project proposed by Michael O’Hara of Tim Lewis Communities in San Ramon. A general surface reconnaissance was conducted by two archeologists and covered the approximately 31-acre flat area where proposed development would occur for the current Spotorno

Ranch project. The survey covered north/south transects approximately 15 to 20 meters apart. The recently plowed flatter fields afforded good to poor surface visibility; however, the area east of the flatter areas offered very poor to nonexistent surface visibility due to very thick annual grasses and other vegetation. No evidence of prehistoric cultural use or archeological resources was found on the Spotorno Property project area by surface survey, nor are any recorded on this previously surveyed parcel.

On March 7, 2018, FCS Senior Archaeologist Dana DePietro conducted an updated pedestrian survey for additional unrecorded cultural resources. The survey focused on the proposed development area in the west of the project boundary, and did not include large portions of the eastern project area upon which no development is planned. The survey began in the southwest corner of the project site and moved east, using north-south transects spaced at 15-meter intervals whenever possible. As noted in the previous survey, the project area has been subject to disking and other ground disturbance associated with agricultural activity at the site. Soil visibility was relatively poor across the site, ranging from 15 to 30 percent, due to grasses and ground cover. Soils in sections of poor visibility were intermittently inspected using a hand trowel. Observed soils were largely composed of dark brown silty soil with high clay content, interspersed with small (2 to 3-centimeter) stones primarily composed of quartz, schist, and basalt. Soils in the west of the project area were noticeably darker in color; however, upon close inspection at multiple locations, did not contain artifacts or materials consistent with midden soils.

Survey conditions were documented using digital photographs and field notes. During the survey, Dr. DePietro examined all areas of the exposed ground surface for prehistoric artifacts (e.g., fire-affected rock, milling tools, flaked stone tools, tool-making debris, ceramics), soil discoloration and depressions that might indicate the presence of a cultural midden, faunal and human osteological remains, and features indicative of the former presence of structures or buildings (e.g., postholes, standing exterior walls, foundations) or historic debris (e.g., glass, metal, ceramics). Particular attention was paid to the southeast of the project area, as it is the closest the creek running parallel to Happy Valley Road. Water and natural resources are traditionally considered to have higher potential for cultural sensitivity as they were attractive locations for prehistoric human settlement, such as CA-ALA-00024, a known habitation site located to the southwest of the project area.

All areas of proposed development were closely inspected for culturally modified soils or other indicators of potential historic or prehistoric resources. No historic or prehistoric cultural resources or raw materials commonly used in the manufacture of tools (e.g., obsidian, Franciscan chert) were found in these areas.

### *University of California of Paleontology (UCMP) Records Search*

On February 23, 2018, consulting paleontologist Dr. Ken Finger performed a records search on the UCMP database for the Spotorno Ranch project site in Alameda County. According to the geologic map by Graymer et al. (2006), the Spotorno Ranch project site is located mostly on the Pleistocene alluvium (Qpa), early Pleistocene and/or Pliocene sediments (QTs), and Miocene sedimentary rocks (Tms). All three of these units have the potential to yield significant paleontological resources. The 0.5-mile search area (dashed red outline) also includes Holocene alluvium (Qha), which is too young to be fossiliferous. Slightly farther to the west are Cretaceous sediments of the Great Valley Complex.

The UCMP database lists 64 Pleistocene vertebrate fossil localities (58 Rancholabrean, six Irvingtonian) in Alameda County, which have yielded a total of 1071 specimens (see attached faunal list). Many of these specimens have been described and figured in professional publications. For Alameda County, the University of California Museum of Paleontology database lists 64 Pleistocene vertebrate localities. Two of the QTl localities yielded a composite Irvingtonian (early to middle Pleistocene) assemblage of *Mammuthus* (mammoth), Equus (horse), *Pilosa* (ground sloths), Lepus (rabbit), and *Clemmys* (pond turtle), whereas the third yielded a *Mammuthus* of Rancholabrean age (late Pleistocene). The 5 Qa localities yielded *Bison bison antiquus* (extinct bison), *Equus*, *Mammut* (mastodon), and *Glossotherium* (ground sloth). Another seven Pleistocene vertebrate localities are in the east-adjacent Altamont quadrangle. They yielded elements of the Rancholabrean fauna, including *Mammuthus columbi* (Columbian mammoth) and *Glossotherium harlani* (Harlan's ground sloth). For Alameda County, the UCMP database also lists two specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch. A copy of Dr. Finger's report may be found in Appendix D.

## 3.4.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, cultural resources impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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

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

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

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

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to cultural resources and found that the project would have a potentially significant impact to cultural resources without mitigation.

As shown in Appendix J, Mitigation Measure K1 is not applicable and Mitigation Measure K2 would be applicable. The mitigation measure applied to the HVSP for cultural resources will be carried forward as a Condition of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen potential cultural impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation and

envisioned in the HVSP FEIR. As shown in Exhibit 2-6b in Section 2, Project Description and discussed in more detail in Section 3.12, Transportation, the project would incorporate new trails as envisioned in the working Draft of the update to the Trails Master Plan. The HVSP FEIR included analysis of impacts of these general trail alignments as well as the Bypass Road, which would have run through the hillside portion of the project site. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts to cultural resources than those analyzed in the HVSP FEIR. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.4.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

### Historic Resources

| | |
|---|---|
| **Impact CUL-1:** | **Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources.** |

#### *Impact Analysis*

Three historic resources have been previously recorded within 0.50-mile radius of the project site, none of which are located within the project site. No historic or prehistoric resources were encountered during the pedestrian survey. Development resulting from the proposed project includes up to 39 homes within approximately 31 acres. The remaining 124 acres would be left intact as open space, 80 acres of which would be permanently preserved as open space that would continue to be used for agriculture/grazing. Because no known historical resources are recorded within the development area, no impacts to known historical resources would occur during project development.

While unlikely, subsurface construction activities always have the potential to damage or destroy previously undiscovered historic and prehistoric resources. Historic resources can include wood, stone, foundations, and other structural remains; debris-filled wells or privies; and deposits of wood, glass, ceramic, and other refuse. Accordingly, implementation of Mitigation Measure (MM) CUL-1 will be required to reduce potential impacts to historic resources that may be discovered during project construction. With the incorporation of mitigation, impacts associated with historic resources would be less than significant.

#### *Level of Significance Before Mitigation*

Potentially significant impact.

#### *Mitigation Measures*

**MM CUL-1** Because of the general proximity of known archaeological site CA-ALA-000024, an archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology should be present during the initial phase of ground disturbance in order to check for the inadvertent exposure of cultural materials. Once soils are made visible in areas of proposed ground disturbance, the archaeologist will assess the likelihood that they contain cultural resources and determine what additional monitoring, if any, will be required. In the event a

potentially significant cultural resource is encountered during subsurface earthwork activities, all construction activities within a 100-foot radius of the find shall cease and workers should avoid altering the materials until an archaeologist has evaluated the situation. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. Potentially significant cultural resources consist of but are not limited to stone, bone, glass, ceramics, fossils, wood, or shell artifacts, or features including hearths, structural remains, or historic dumpsites. The archaeologist shall make recommendations concerning appropriate measures that will be implemented to protect the resource, including but not limited to excavation and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Any previously undiscovered resources found during construction within the project site shall be recorded on appropriate Department of Parks and Recreation (DPR) 523 forms and will be submitted to the City of Pleasanton, the Northwest Information Center, and the State Historic Preservation Office (SHPO), as required.

### *Level of Significance After Mitigation*

Less than significant impact.

## Archaeological Resources

**Impact CUL-2: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources.**

### *Impact Analysis*

Records search results from the NWIC indicates one prehistoric archaeological resource lies within 0.5 mile of the project site.[1] The resource, CA-ALA-000024, yielded mortars, pestles, and arrowheads, and is likely a significant habitation site. While the site is not located within the project boundary or in close enough proximity to potentially extend into the project area, its presence in the vicinity indicates a higher potential for undiscovered buried archaeological deposits within the project area.

Such resources could consist of but are not limited to stone, bone, wood, or shell artifacts or features, including hearths and structural elements. Accordingly, this is a potentially significant impact. Implementation of MM CUL-1 would ensure that this potential impact is reduced to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

[1] The location of the site cannot be identified in this SEIR. Environmental documents must not include information about the location of an archeological site or sacred lands or any other information that is exempt from public disclosure pursuant to the Public Records Act (Cal. Code Regs. § 15120(d); Clover Valley Foundation v. City of Rocklin (2011) 197 Cal.App.4th 200, 220). Native American graves, cemeteries, and sacred places and records of Native American places, features, and objects are also exempt from disclosure (Pub. Resources Code, §§ 5097.9, 5097.993.). This exclusion reflects California's strong policy in favor of protecting Native American artifacts. Confidential cultural resource inventories or reports generated for environmental documents should be maintained by the lead agency under separate cover and shall not be available to the public (Clover Valley at 221, citing Governor's Office of Planning and Research, Cal. Tribal Consultation Guidelines, (Nov. 14, 2005 supp. p. 27).

### *Mitigation Measures*

Implement MM CUL-1.

### *Level of Significance After Mitigation*

Less than significant impact.

## Paleontological Resources

**Impact CUL-3: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources.**

### *Impact Analysis*

Dr. Finger's report concluded that about the project site is situated upon Pleistocene alluvium, early Pleistocene and/or Pliocene sediments, and Miocene sedimentary rocks. All three of these units have high potential of yielding significant paleontological resources. The UCMP database lists 64 Pleistocene vertebrate fossil localities in Alameda County, which have yielded a total of 1071 specimens. The project area should therefore be considered moderate to highly sensitive for undiscovered paleontological resources.

Sub-surface construction activities associated with the proposed project, such as grading and trenching, could result in a significant impact to paleontological resources, if encountered. Paleontological resources may include but are not limited to fossils from mammoths, saber-toothed cats, rodents, reptiles, and birds. Accordingly, implementation of MM CUL-3 will be required to reduce potential impacts to paleontological resources that may be discovered during project construction. With the incorporation of mitigation, impacts associated with paleontological resources would be less than significant.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM CUL-3** A professional paleontologist shall be present during the initial phase of ground disturbance to check for the inadvertent exposure of fossils or other resources of paleontological value. This may be followed by regular periodic or "spot-check" paleontological monitoring during ground disturbance as needed, but full-time monitoring is not required at this time. In the event that fossils or fossil-bearing deposits are discovered during construction activities, excavations within a 100-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The Applicant shall include a standard inadvertent discovery clause in every construction contract to inform contractors of this requirement. The paleontologist shall document the discovery as needed in accordance with Society of Vertebrate Paleontology standards and assess the significance of the find under the criteria set forth in CEQA Guidelines Section 15064.5. The paleontologist shall notify the appropriate agencies to determine procedures that would be followed before construction activities are allowed to

resume at the location of the find. If the Applicant determines that avoidance is not feasible, the paleontologist shall prepare an excavation plan for mitigating the effect of construction activities on the discovery. The plan shall be submitted to the City of Pleasanton for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan.

### *Level of Significance After Mitigation*

Less than significant impact.

## Burial Sites

**Impact CUL-4: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites.**

### *Impact Analysis*

No human remains or cemeteries are known to exist within or near the project site. However, there is always the possibility that subsurface construction activities associated with the project, such as trenching and grading, could potentially damage or destroy previously undiscovered human remains. Accordingly, this is a potentially significant impact. In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code Sections 5097.94 and Section 5097.98 must be followed. In the unlikely event human remains are discovered, implementation of MM CUL-4 would reduce this potential impact to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM CUL-4** In the event of the accidental discovery or recognition of any human remains, CEQA Guidelines Section 15064.5, Health and Safety Code Section 7050.5, and Public Resources Code Sections 5097.94 and Section 5097.98 must be followed. If during the course of project development there is accidental discovery or recognition of any human remains, the following steps shall be taken:

1. There shall be no further excavation or disturbance within 100 feet of the remains until the County Coroner is contacted to determine if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the Native American Heritage Commission (NAHC) within 24 hours, and the NAHC shall identify the person or persons it believes to be the most likely descendant (MLD) of the deceased Native American. The MLD may make recommendations to the landowner or the person responsible for the excavation work within 48 hours, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98.

2. Where the following conditions occur, the landowner or his or her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendant or on the project site in a location not subject to further subsurface disturbance:
   - The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 48 hours after being notified by the commission.
   - The descendant identified fails to make a recommendation.
   - The landowner or his authorized representative rejects the recommendation of the descendant, and mediation by the NAHC fails to provide measures acceptable to the landowner.

Additionally, California Public Resources Code Section 15064.5 requires the following relative to Native American Remains:

- When an initial study identifies the existence of, or the probable likelihood of, Native American Remains within a project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code Section 5097.98. The applicant may develop a plan for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American Burials with the appropriate Native Americans as identified by the Native American Heritage Commission.

### *Level of Significance After Mitigation*

Less than significant impact.

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# 3.5 - Geology, Soils, and Seismicity

## 3.5.1 - Introduction

This section describes the existing geology, soils, and seismicity setting and potential effects from project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based on, among other things, the 2015 Geotechnical Feasibility Report prepared by ENGEO, Inc., and included in this Subsequent EIR as Appendix E. In 2018, ENGEO reviewed the analysis and conclusions from the 2015 Report and confirmed their validity. This confirmation letter can also be found in Appendix E. Additional information was gathered from the City of Pleasanton General Plan, Association of Bay Area Governments (ABAG) Resilience Program, and the United States Department of Agriculture (USDA) Natural Resources Conservation Service Web Soil Survey.

## 3.5.2 - Environmental Setting

### Geologic Setting

The project site is located within the Coast Ranges geomorphic province of California. The Coast Ranges are dominated by a series of northwest-trending mountain ranges that have been folded and faulted in a tectonic regime with intervening alluvial valleys. The project site is located in the Spotorno Flat Area within Happy Valley.

The project site is underlain by bedrock formations from the Pliocene to Pleistocene Livermore gravels (QTI). The Livermore gravels consist of stream terrace deposits of weakling consolidated, poorly sorted siltstone, sandstone and conglomerate. The Livermore gravels are mapped toward the northeastern portion of the site. Alluvium (Qa), colluvium (Qc), and landslide deposits (Qls) are also mapped in several locations within the project site.

The highest elevation on the project site is approximately 683 feet near the top of a hill in the eastern portion of the study area and the lowest elevation is approximately 384 feet in the western end of the flatland area adjacent to Alisal Street.

## 3.5.3 - Existing Conditions

### Geologic Units and Soils

The project site contains some previous grading that was limited to the construction of the dirt roads. Existing fill associated with the previous grading appears to be less than 3 to 4 feet thick and is located in the northern section of the study area and beyond the 25-percent slope limit.

#### *Residual Soil*

In the upland areas of the project site, bedrock is capped with a relatively thin layer of residual soil, soil that develops essentially in-place from weathering of the underlying parent material. The USDA maps residual soil as Linne clay loam having strongly calcareous and slightly plastic characteristics. Residual soil consists predominantly of dark brown, silty or sandy clay that appears to be dry and hard without significant porosity.

### *Colluvium*

Regional mapping of surficial deposits in the vicinity shows much of the base of the west-facing slope near the project site to be underlain by colluvium (Geotechnical Feasibility Report, Figure 4). Colluvial deposits were found to range from silty clay to sandy clay with some fine gravel. The colluvial deposits were typically dark brown, very stiff to hard and varied from dry to moist. Based on the findings of the ENGEO exploration and data by previous studies, the colluvium appears to range up to about 16 feet in thickness.

### *Alluvium*

The USDA maps alluvial topsoil within the project site as Rincon loam having neutral to mild alkalinity and very plastic characteristics, and Pleasanton gravelly loam in the southern portion of the study area consisting of alluvium derived from sandstone and shale. Alluvial materials (Qal) consisting of relatively young, unconsolidated stream deposits were encountered in the borings on the relatively flat western portion of the study area. Alluvial soils encountered consist of silty or sandy clay with some gravel and minor layers of clayey sand and gravel. The alluvium encountered was primarily medium stiff to hard clay with some medium dense to dense silty or clayey sand and ranged in thickness up to about 18 feet. The laboratory test results indicate that the surficial soils have low to high plasticity and corresponding moderate to high expansion potential.

### *Livermore Gravels*

Portions of the project site are underlain by Livermore Gravels at relatively shallow depths, and are indicated on the Geologic Map (Geotechnical Feasibility Report, Figure 3) using the symbol QTI. During the on-site reconnaissance conducted by ENGEO, the test pits and borings revealed that the Livermore gravels consist predominantly of light olive-gray and olive-brown siltstone and sandstone with some interbedded light olive-gray conglomerate. The bedrock encountered was friable to weak and varied from thinly to thickly bedded. A few test pits encountered slightly cemented siltstone that was moderately difficult to excavate with the small excavator used for the exploration. Bedrock structure noted in the test pits was striking generally northwest with dips ranging from 10 to 30 degrees to the northeast. Some beds at lower elevations were striking in a more northerly to northeasterly direction and had steeper dip angles ranging up to 50 degrees. Bedding planes appeared to be poorly developed and/or gradational.

## Seismicity

The term seismicity refers to the location, frequency, magnitude, and other characteristics of earthquakes. To understand the implications of seismic events, a discussion of faulting and seismic hazards is provided below.

## Faulting

Faults form in rocks when stresses overcome the internal strength of the rock, resulting in a fracture. Large faults develop in response to large regional stresses operating over a long time, such as those stresses caused by the relative displacement between tectonic plates. According to the elastic rebound theory, these stresses build up in the earth's crust until enough stress has built up to exceed the strength along a fault and cause a brittle failure. The rapid slip between the two stuck plates or

coherent blocks generates an earthquake. Following an earthquake, stress will build once again until the occurrence of another earthquake. The magnitude of slip is related to the maximum allowable stress that can be built up along a particular fault segment. The greatest buildup in stress due to the largest relative motion between tectonic plates or fault blocks over the longest period will generally produce the largest earthquakes. The distribution of these earthquakes is a study of much interest for both hazard prediction and the study of active deformation of the earth's crust. Deformation is a complex process, and strain caused by tectonic forces is not only accommodated through faulting, but also by folding, uplift, and subsidence, which can be gradual or in direct response to earthquakes.

Faults are mapped to determine earthquake hazards, since they occur where earthquakes tend to recur. A historic plane of weakness is more likely to fail under stress than a previously unbroken block of crust. Faults are, therefore, a prime indicator of past seismic activity, and faults with recent activity are presumed to be the best candidates for future earthquakes. However, since slip is not always accommodated by faults that intersect the surface along traces, and since the orientation of stress and strain in the crust can shift, predicting the location of future earthquakes is complicated. Earthquakes sometimes occur in areas with previously undetected faults or along faults previously thought inactive.

## Local Faulting

The study area is located within a State of California Earthquake Fault Hazard Zone for the Verona Fault, which crosses the site adjacent to the 25-percent slope limit (Geotechnical Feasibility Report, Figure 6). The Calaveras and Las Positas faults are located approximately 2 miles southwest and 4 miles east of the study area, respectively. The Greenville fault is located approximately 10 miles to the east. The Hayward fault is located approximately 7 miles to the southwest. The San Andreas Fault is located approximately 27 miles to the southwest. Each of these faults has produced earthquakes within the last 200 years. The maximum earthquake for the region is expected from the San Andreas Fault, the major active fault within the Bay Area. Maximum earthquakes in the Moment Magnitude 6 to 7 range can be expected from the Hayward, Calaveras, and Concord faults. The Greenville fault is assigned a maximum Moment Magnitude of approximately 6.9. Figure 7 of the Geotechnical Feasibility Report shows the study area in relation to the faults discussed. In general, the project site is located within a seismically active area.

The Uniform California Earthquake Rupture Forecast (UCERF) evaluated the 30-year probability of a Moment Magnitude 6.7 or greater earthquake occurring on the known active fault systems in the Bay Area, including the Calaveras fault. The UCERF generated an overall probability of 63 percent for the Bay Area as a whole, a probability of 31 percent for the Hayward fault, 7 percent for the Calaveras fault, and 3 percent for the Concord-Green Valley fault.

## Seismic Hazards

Potential seismic hazards resulting from a nearby moderate to major earthquake can be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, ground lurching, soil liquefaction, and lateral spreading. These hazards are discussed individually.

### *Ground Rupture*

Fault rupture is a seismic hazard that affects structures sited above an active fault. The hazard from fault rupture is the movement of the ground surface along a fault during an earthquake. Typically, this movement takes place during the short time of an earthquake but can also occur slowly over many years in a process known as creep. Most structures and underground utilities cannot accommodate the surface displacements of several inches to several feet commonly associated with fault rupture or creep.

### *Ground Shaking*

The severity of ground shaking depends on several variables such as earthquake magnitude, epicenter distance, local geology, thickness, and seismic wave-propagation properties of unconsolidated materials, groundwater conditions, and topographic setting. Ground shaking hazards are most pronounced in areas near faults or with unconsolidated alluvium.

The most common type of damage from ground shaking is structural damage to buildings, which can range from cosmetic cracks to total collapse. The overall level of structural damage from a nearby large earthquake would likely be moderate to heavy, depending on the characteristics of the earthquake, the type of ground, and the condition of the building. Besides damage to buildings, strong ground shaking can cause severe damage from falling objects or broken utility lines. Fire and explosions are also hazards associated with strong ground shaking.

While Richter magnitude provides a useful measure of comparison between earthquakes, the moment magnitude is more widely used for scientific comparison, since it accounts for the actual energy released by the earthquake. Actual damage is due to the propagation of seismic or ground waves as a result of the earthquake, and the intensity of shaking is related to earthquake magnitude and distance as well as to the condition of underlying materials. Loose and soft materials tend to amplify long period vibrations, while hard rock can quickly attenuate them, causing little damage to overlying structures. For this reason, the Modified Mercalli Intensity (MMI) Scale provides a useful qualitative assessment of ground shaking. The MMI Scale is a 12-point scale of earthquake intensity based on local effects experienced by people, structures, and earth materials. Each succeeding step on the scale describes a progressively greater amount of damage at a given point of observation.

As previously indicated, there is an aggregated 63 percent probability of a 6.7 Mw or greater earthquake on an active Bay Area fault over the next 30 years. According to the Pleasanton General Plan, portions of the City that are underlain by loosely compacted soil may experience the greatest amount of ground shaking and damage.

### *Ground Failure*

Ground failure includes liquefaction and the liquefaction-induced phenomena of lateral spreading, and lurching.

Liquefaction is a process by which sediments below the water table temporarily lose strength during an earthquake and behave as a viscous liquid rather than a solid. Liquefaction is restricted to certain geologic and hydrologic environments, primarily recently deposited sand and silt in areas with high

groundwater levels. The process of liquefaction involves seismic waves passing through saturated granular layers, distorting the granular structure, and causing the soil to densify.

Liquefaction can cause the soil beneath a structure to lose strength, which may result in the loss of foundation-bearing capacity and which could cause a structure to settle or tip. Liquefaction can also result in the settlement of large areas because of the densification of the liquefied deposit. Where structures are located within liquefied deposits, the liquefaction can result in the structure to rise as a result of buoyancy. The 2015 Geotechnical Exploration prepared for the entire project site concluded that, based on existing subsurface information and experience in the project vicinity, the potential for liquefaction is not a significant risk.

Lateral spreading is lateral ground movement, with some vertical component, as a result of liquefaction. In effect, the soil rides on top of the liquefied layer. Lateral spreading can occur on relatively flat sites with slopes less than 2 percent, under certain circumstances, and can cause ground cracking and settlement. The potential for lateral spreading within the project site was considered low, due to the limited amount of potentially liquefiable material and lack of free-faces.

### *Landslides and Slope Failure*

Landslides and other forms of slope failure form in response to the long-term geologic cycle of uplift, mass wasting, and disturbance of slopes. Mass wasting refers to a variety of erosional processes from gradual downhill soil creep to mudslides, debris flows, landslides, and rock fall. These processes are commonly triggered by intense precipitation. Seismic activity can also trigger landslides and rock falls.

Often, various forms of mass wasting are grouped together as landslides, which are generally used to describe the downhill movement of rock and soil. Geologists classify landslides into several different types that reflect differences in the type of material and type of movement. The 2015 ENGEO report indicates that several landslides have been mapped within or immediately adjacent to the Residential Development Area, especially near the 25-percent slope limit as seen in Figure 2 of the ENGEO report. Therefore, the potential for earthquake-induced landsliding on-site exists. Several of the explored landslides were found to be at least 30 to 40 feet thick and consist of earthflow and earthflow complexes, bedrock slumps, and transitional landslides.

### *Expansive Soils*

Expansive soil can shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Structures can be supported on structural reinforced mat foundations that are designed to accommodate shrinking and swelling subgrade soils. Successful construction on expansive soil requires special attention during grading. It is imperative to keep exposed soil moist by occasional sprinkling. If the soil dries, it is extremely difficult to remoisturize the soil (because of its clayey nature) without excavation, moisture conditioning, and recompaction.

Conventional grading operations, incorporating fill placement specifications tailored to the expansive characteristics of the soil, and use of a mat foundation (either post-tensioned or conventionally reinforced) are common and generally cost-effective measures to address the expansive potential of

the foundation soils. The 2015 ENGEO report concluded that the effects of expansive soil are expected to pose a risk to the project site, but can be properly mitigated.

## 3.5.4 - Regulatory Framework

### Federal

#### *National Earthquake Hazards Reduction Program*

The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law 95–124. In establishing the NEHRP, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices, land use controls and redevelopment, prediction techniques and early warning systems, coordinated emergency preparedness plans, and public education and involvement programs. The four basic goals remain unchanged:

- Develop effective practices and policies for earthquake loss reduction and accelerate their implementation.
- Improve techniques for reducing earthquake vulnerabilities of facilities and systems.
- Improve earthquake hazards identification and risk assessment methods, and their use.
- Improve the understanding of earthquakes and their effects.

Several key federal agencies contribute to earthquake mitigation efforts. There are four primary NEHRP agencies:

- National Institute of Standards and Technology of the Department of Commerce
- National Science Foundation
- United States Geological Survey (USGS) of the Department of the Interior
- Federal Emergency Management Agency (FEMA) of the Department of Homeland Security

Implementation of NEHRP priorities is accomplished primarily through original research, publications, and recommendations to assist and guide state, regional, and local agencies in the development of plans and policies to promote safety and emergency planning.

### State Regulations

#### *Alquist-Priolo Earthquake Fault Zoning Act*

The Alquist-Priolo Earthquake Fault Zoning Act (Public Resources Code [PRC] Sections 2621 to 2630) was passed in 1972 to provide a statewide mechanism for reducing the hazard of surface fault rupture to structures used for human occupancy. The main purpose of the Act is to prevent the siting of buildings used for human occupancy across the traces of active faults. It should be noted that the Act addresses the potential hazard of surface fault rupture and is not directed toward other earthquake hazards, such as seismically induced ground shaking or landslides.

The law requires the State Geologist to identify regulatory zones (known as Earthquake Fault Zones or Alquist-Priolo Zones) around the surface traces of active faults, and to depict these zones on

topographic base maps, typically at a scale of 1 inch to 2,000 feet. Earthquake Fault Zones vary in width, although they are often 0.75 mile wide. Once published, the maps are distributed to the affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. With the exception of single-family wood-frame and steel-frame dwellings that are not part of a larger development (i.e. four units or more), local agencies are required to regulate development within the mapped zones. In general, construction within 50 feet of an active fault zone is prohibited.

### *Seismic Hazards Mapping Act*

The Seismic Hazards Mapping Act (PRC Sections 2690 to 2699.6), which was passed in 1990, addresses earthquake hazards other than surface fault rupture. These hazards include strong ground shaking, earthquake-induced landslides, liquefaction, or other ground failures. Much like the Alquist-Priolo Earthquake Fault Zoning Act discussed above, these seismic hazard zones are mapped by the State Geologist to assist local government in the land use planning process. The Act states, "it is necessary to identify and map seismic hazard zones in order for cities and counties to adequately prepare the safety element of their general plans and to encourage land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety." The Act also states, "cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard."

### *California Building Code*

The State of California provides minimum standards for building design through the California Building Standards Code (California Code of Regulations, Title 24). Where no other building codes apply, Chapter 29 regulates excavation, foundations, and retaining walls. The California Building Standards Code (CBC) applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The CBC has been modified for California conditions with more detailed and/or more stringent regulations.

The State earthquake protection law (California Health and Safety Code Section 19100, et seq.) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the CBC. The CBC identifies seismic factors that must be considered in structural design. Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

The CBC is updated every 3 years, and the current 2016 CBC took effect January 1, 2017. The 2016 CBC has been adopted by the City of Pleasanton and is reflected in the Pleasanton Municipal Code.

## Local Regulations

### *City of Pleasanton*

*General Plan*

The Pleasanton General Plan sets forth the following goals, policies, and programs related to geology and soils:

**Safety Element**

- **Goal 1:** Minimize the risks to lives and property, and minimize the potential liability to the City due to seismic activity within the General Plan Area.
  - **Policy 1:** Restrict development in areas prone to seismic safety hazards.
    - **Program 1.1:** Comply with the Alquist-Priolo Act and other seismic safety criteria established by the City of Pleasanton.
  - **Policy 2:** Investigate the potential for seismic hazards during the development review process, and implement soils engineering and construction standards which minimize potential danger from earthquakes.
    - **Program 2.1:** Require site-specific soils, geologic, and/or geotechnical engineering studies prior to development approval of structures for human occupancy for any project proposed within areas shown on current Alquist-Priolo Earthquake Fault Zones Maps. For development within areas identified as severe through violent seismic shaking amplification (Figure 5-3: Relative Intensity of Ground Shaking) outside of the Alquist-Priolo Earthquake Fault Zone, the site-specific soils and/or geotechnical report shall address the impacts of seismic ground shaking on proposed structures, infrastructure, and ground stability.
    - **Program 2.2:** Design and construct all structures to address potential seismic and geologic hazard conditions according to the California Building Code (CBC) standards or more stringent standards. All structures and facilities not addressed by the CBC shall be designed and constructed to mitigate potential seismic and geologic hazards as recommended by site-specific soils, geologic, and/or geotechnical engineering studies.
    - **Program 2.5:** Require technical review and analysis of soils, geologic, and geotechnical studies by a qualified consulting engineering geologist reporting to the City of Pleasanton. Incorporate the recommendations of the City's consulting engineer into the project design.
    - **Program 2.6:** Require professional inspection of foundations, piers, excavation, earthwork, and other aspects of site development during construction. Ensure that all mitigations recommended by the City's consulting engineer are incorporated into the project construction.
  - **Policy 3:** Require post-earthquake construction, if needed, to conform to all City codes and ordinances.
    - **Program 3.1:** Require building permits and enforce all current building requirements and codes for post-earthquake construction.
- **Goal 2:** Minimize the risks to lives and property, and minimize potential liability to the City, due to geologic hazards within the Plan Area.
  - **Policy 5:** Investigate the potential for geologic hazards as part of the development review process, and maintain this information for the public record.
    - **Program 5.1:** Require site-specific soils studies for all new development prior to the issuance of building permits and prior to the approval of final improvement plans. Where

there is risk of geologic hazards, the soil study should address seismic shaking, lateral spreading, differential settlement, lurch cracking, liquefaction, erosion, and expansive soils.

- **Program 5.2:** Require site-specific geologic and/or geotechnical engineering studies prior to development approval where there is risk of the following geologic hazards: surface fault rupture, bank failures, rock falls, landslides, and for areas with slopes equal to or greater than 20 percent.
- **Program 5.3:** Require measures to mitigate potential geologic safety hazards during adverse conditions such as saturated soils and ground shaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Mitigation measures identified by the site engineering studies shall be incorporated into the project design.
- **Program 5.4:** Require technical review and analysis of geotechnical studies by a qualified consulting geotechnical engineer reporting to the City. Incorporate the recommendations of the City's consulting engineer into the project design.
- **Program 5.5:** Discourage development in areas with a high risk of geologic hazards as identified by a California licensed engineering geologist representing the City. Allow development only when geologic and soils investigations demonstrate that hazards can be mitigated by accepted engineering and construction techniques. Mitigation measures identified by the investigations shall be incorporated into the project design and subject to approval by the City's reviewing geologist/engineer.

- **Policy 6:** Restrict new development of sites with structures intended for human occupancy in any landslide-prone or unstable area.
  - Program 6.1**:** Prohibit new development of sites with structures intended for human occupancy in any landslide-prone areas unless the landslide risk can be eliminated. Permit development in landslide prone areas only when sites can be shown to be stable during adverse conditions such as saturated soils, ground shaking, and during grading of the site for roads, installation of infrastructure, and creation of building pads. Engineering studies shall demonstrate that structures in landslide prone areas would sustain no more damage due to slope instabilities than damage sustained by a similar building in the Pleasanton Planning Area constructed to current CBC standards and located on soils with a low susceptibility to failure when exposed to moderate ground shaking.
  - **Program 6.2:** Require developers to include drainage, erosion, and landslide mitigation measures to reduce landslide potential.
  - **Program 6.3:** Design irrigation systems to minimize the potential for soil saturation, excessive run-off, and other factors deemed to contribute to slope instability.

*Municipal Code*

Section 9.14 of the Pleasanton Municipal Code, known as the Stormwater Management and Discharge Control Ordinance establishes requirements for eliminating non-stormwater discharges to the municipal storm sewer, controlling the discharge to municipal storm sewers, separating storm sewers from spills, dumping or disposal of materials other than stormwater, and reducing pollutants in stormwater discharges to the maximum extent practicable.

## 3.5.5 - Methodology

FCS relied upon the information contained in the Preliminary Geotechnical Feasibility Report prepared by ENGEO dated January 9, 2015, which is provided in Appendix E, as the basis for evaluating geologic, soil, and seismicity impacts related to development proposed on the project site. The purpose of the Preliminary Feasibility Report was to assess the potential geotechnical concerns associated with the proposed development on the project site. ENGEO conducted a field exploration with drilling, coring, and laboratory testing of subsurface materials. Soil samples were laboratory tested to determine engineering properties. ENGEO also reviewed published geologic literature and previous explorations regarding the geological and geotechnical characteristics of the project site and vicinity.

FCS obtained additional information from sources including the City of Pleasanton General Plan, the California Department of Conservation, and the USDA Natural Resources Conservation Service Web Soil Survey.

## 3.5.6 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to geology and soils are significant environmental effects, the following questions are analyzed and evaluated. 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.
   ii. Strong seismic ground shaking?
   iii. Seismic-related ground failure, including liquefaction?
   iv. Landslides?

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

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?

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?

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

f) Contribute to cumulative geology and soils impacts in the project area?

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FIR evaluated project impacts in relation to geology, soils, and seismicity. The HVSP FEIR found that the project would result in significant unavoidable impacts in relation to exposure of people to seismic hazards. However, all other impacts related to geology, soils, and seismicity would be less than significant with mitigation measures incorporated.

Appendix J provides a list of mitigation measures from the HVSP FEIR that are applicable to the proposed project. As shown in Appendix J, Mitigation Measure H3 is not applicable. Mitigation Measures H1 and H2 as well as H4 through H8 are applicable to the proposed project. These mitigation measures, applied to the HVSP for geology, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the impacts to geology and soils of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation and envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more serve environmental impacts than those analyzed in the HVSP FEIR in relation to geology and soils. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures where needed.

## 3.5.7 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

### Earthquakes

| | |
|---|---|
| **Impact GEO-1:** | **The project would potentially expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving:**<br>**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.**<br>**ii) Strong seismic ground shaking.**<br>**iii) Seismic-related ground failure, including liquefaction.**<br>**iv) Landslides.** |

#### *Impact Analysis*

This impact assesses the potential for the project to expose people or structures to potential substantial adverse effects involving seismic hazards.

*i) Fault Rupture*

The project site is located within a State of California Earthquake Fault Hazard Zone for the Verona Fault, which crosses the site adjacent to the 25-percent slope limit. Several other faults, including the Calaveras and Las Positas faults, are located approximately 2 miles southwest and 4 miles east of the project site, respectively. The Greenville fault is located approximately 10 miles to the east. The Hayward fault is located approximately 7 miles to the southwest. The San Andreas fault is located approximately 27 miles to the southwest. The project site is located in an area of high seismicity, as is all of the San Francisco Bay Area. However, all development associated with the project would be located in the Spotorno Flat Area on western portion of the site. A "Building Restriction Zone" would extend to 50 feet on both sides of the Verona Fault Area, as shown in Exhibit 2-4. The building design would adhere to all applicable requirements from the California Building Code (CBC) at a minimum. Accordingly, MM GEO-1a is proposed regarding foundation design. Compliance with the requirements of the CBC, recommendations from the ENGEO report, and the Pleasanton General Plan policies would reduce impacts to less than significant.

*ii) Strong Ground Shaking*

The region in which the project site is located is considered seismically active. Small earthquakes occur within the region every year, and large earthquakes have occurred and are expected to occur in the future. Based on the proximity of the project site to known active seismic sources, it should be expected that the project site would experience moderately strong to strong seismic ground shaking during the project's lifetime.

To mitigate the ground shaking effects, all structures shall be designed using sound engineering judgment and the latest California Building Code (CBC) requirements, at a minimum. Recommendations on the appropriate level of soil engineering and building design necessary to minimize ground-shaking hazards are outlined in MM GEO-1b. The implementation of this mitigation measure would ensure that impacts related to strong ground shaking hazards would be less than significant.

*iii) Ground Failure and Liquefaction*

The 2015 Geotechnical Feasibility Report prepared for the entire project site concluded that, based on existing subsurface information and experience in the project site and vicinity, the potential for liquefaction for the entire project site is likely to be low with proposed improvements to differential settlement, which has been included under MM GEO-1a. Furthermore, the United States Geological Survey (USGS) and the ABAG Resilience Program has mapped the area to have low susceptibility for liquefaction. Implementation of MM GEO-1a would include the consideration of liquefaction potential in site design plans, and would ensure that impacts would be less than significant.

*iv) Landslides*

The 2015 geotechnical report indicates that numerous landslides have been mapped within or immediately adjacent to the project site (Geotechnical Feasibility Report, Figure 2). Seismic ground shaking can trigger deformation of high graded slopes or unstable natural hillsides. All housing units and structures would be located below the 25 percent slope line, and all grading for the purposes of constructing the residential structure would also occur below the 25 percent slope line, as shown in

Exhibit 2-8 in Section 2, Project Description. Existing landslide deposits within any proposed grading envelope should be mitigated by corrective grading as described in MM GEO-1b. The only work that would occur at or slightly above the 25 percent grade line would be remedial work for the purposes of improving safety, as shown in Exhibit 3.5-1. The potentially damaging landslides would be removed, a keyway would be built and then re-filled as engineered fill, and then the original grade of the slope would be restored.[1] In general, corrective grading should completely remove unstable soils down to in-place bedrock within the envelope of proposed improvements. Structural walls to protect upslope areas are also suggested.

No residential structures are allowed to be built within the landslide area, due to the Building Restriction Zone that extends to 50 feet on both sides of the Verona Fault Area. Because no residential pads or residential structures are located within the landslide repair area, there is no grading to construct residential structures within this area. Furthermore, implementation of the recommendations set forth in MM GEO-1b would reduce impacts to less than significant.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM GEO-1a** The project applicant shall adhere to the recommendations set forth in the 2015 ENGEO Geotechnical Feasibility Report for building foundation design. Structures shall be supported on structural mat foundations, with a minimum matt thickness of 10-12 inches. Maximum allowable bearing loads may also be increased by one-third when considering total loads from wind and seismic activities. Building design shall also include up to 1 inch of differential settlement, over a distance of 50 feet.

**MM GEO-1b** The applicant shall remove all existing colluvium and landslide debris within the residential development limit within the west-facing slope located near the 25-percent slope limit. On-site soil and rock material shall be processed to remove concentrations of organic material and particles greater than 8 inches if it is to be used as fill material. Building pads shall also be reconstructed to create uniform subgrade conditions by sub excavating the soil on building pads to a minimum depth of 2 feet below finished pad grade on cut lots or lots constructed over cut-and-fill transitions and replacing the sub excavated material with uniformly mixed compacted fill. Sub excavations shall be performed over the entire flat pad area. Different fill thickness across any lot shall be no greater than 10 feet. Slope gradients shall not be steeper than 3:1. Slopes inclined steeper than 3:1 will require evaluation and geogrid reinforcement. Further details regarding soil engineering and building design can be found under “Preliminary Site Recommendations” of the ENGEO report.

[1] As indicated in Exhibit 2-8 in Section 2, Project Description, an estimated 31,000 cubic yards of cut and an equal amount of fill would be required for the landslide repair work. The excavated material would be re-used as engineered fill, and then the original grades would be restored. As a result, the site grading would be balanced for grading required for landslide repair work, and then neither off-haul nor import of dirt would be required.

### *Level of Significance After Mitigation*

Less than significant impact.

## Soil Erosion or Topsoil Loss

**Impact GEO-2: The project would potentially result in substantial soil erosion or the loss of topsoil.**

### *Impact Analysis*

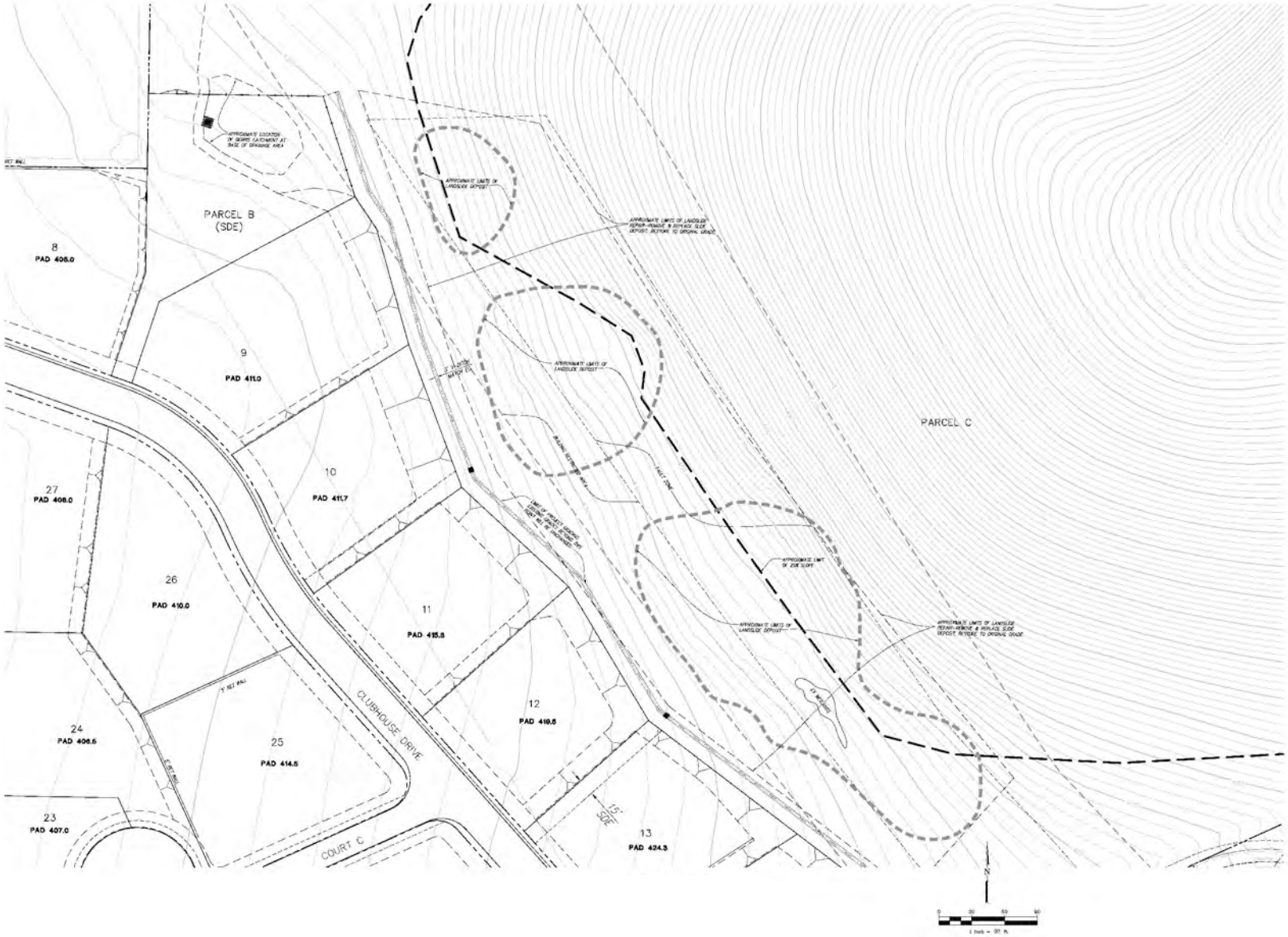
The project Applicant is proposing to rezone and subdivide the project site to support 39 single-family residential lots and roadways on the 31-acre Spotorno Flat Area portion of the site and to permanently preserve approximately 80 acres as open space as shown in Exhibits 2-3 and 2-15 of Section 2, Project Description.

The proposed project would involve grading, building construction, paving, and utility installation activities that could result in erosion and sedimentation. Left unabated, the accumulation of sediment in downstream waterways could result in the blockage of flows, potentially causing increased localized ponding or flooding. However, the developer would be required to obtain a National Pollutant Discharge Elimination System (NPDES) permit issued by the Regional Water Quality Control Board, which is discussed in Section 3-08, Hydrology and Water Quality.

Under the NPDES permitting program, the preparation and implementation of Stormwater Pollution Prevention Programs (SWPPPs) are required for construction activities more than 1 acre in size. The SWPPP must identify potential sources of erosion or sedimentation that may be reasonably expected to affect the quality of stormwater discharges as well as identify Best Management Practices (BMPs) that ensure the reduction of these pollutants during stormwater discharges. Typical BMPs intended to control erosion include sand bags, detention basins, silt fencing, landscaping, hydroseeding, storm drain inlet protection, street sweeping, and monitoring of water bodies.

Prior to construction grading, the project Applicant would file a Notice of Intent to comply with the General NPDES Permit issued to the Regional Water Quality Control Board and prepare the SWPPP, which addresses the measures that would be included in the project to minimize and control construction and post-construction runoff to the “maximum extent practicable.” In addition, development of the project would be required to comply with the City Code requirements pertaining to grading and excavation. Site grading within project would include cuts varying in depth to 15 feet, with fills varying up to 25 feet deep. Retaining walls are also included in the site plan development.

In addition, the 2015 Geotechnical Report recommends that pavement areas be sloped at a minimum of 1 percent toward drop inlets and other surface drainage facilities, that roof downspouts be discharged into closed conduits and directed away from buildings to appropriate drainage devices, and that finished grade be sloped away from building exteriors at a minimum of 5 percent for a distance of at least 10 feet.




Source: Ruggeri-Jensen-Azar, May 2018.

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Exhibit 3.5-1
Slope Repair Plan

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The drainage facilities would intercept and divert surface water runoff from slopes, and would reduce runoff velocities, water infiltration, and sloughing or erosion of the slope surfaces. Consistent with this recommendation, driveways within the project site would direct stormwater and any erosion to the appropriate drainage facilities. A concrete v-ditch would be located at the eastern portion of the site, facing the building restricted area, along the rear yards of the outermost residential lots to collect stormwater from the surrounding hillsides. The v-ditch would direct stormwater and any erosion to a drainage management area, discussed in further detail in the Section 3.13, Utilities and Service Systems section. Compliance with County Code would require appropriate erosion control planning in the form of a stormwater control plan.

The 2015 report recommended that prior to halting grading activities tops of fill or cut slopes be graded in such a way as to prevent water from flowing freely down slopes. A positive gradient away from existing fill or cut slopes would carry the surface runoff away from the slopes to areas where erosion can be controlled. Slope gradients for proposed graded slopes should not be steeper than 3:1 (horizontal: vertical); slopes inclined steeper than 3:1 would require special evaluation and may require geogrid reinforcement. Such procedures would be outlined in the design-level geotechnical investigation and implemented as required by MM GEO-1a and MM GEO-1b.

Implementation of the above requirements (including the preparation and implementation of an SWPPP and compliance with Municipal Code requirements) would ensure that potential construction related erosion impacts would be less than significant. Furthermore, the landscaping plans will implement strategies to reduce soil loss during the operational lifetime of the project. Compliance with existing regulations described above would ensure the project would not result in significant soil erosion.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement MMs GEO-1a and GEO-1b.

### *Level of Significance After Mitigation*

Less than significant impact.

## Unstable Geologic Units and Soils

| | |
|---|---|
| **Impact GEO-3:** | **The project would 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.** |

### *Impact Analysis*

As discussed previously, the 2015 Geotechnical Report indicated that development of the project site is feasible from a geotechnical standpoint, provided that appropriate mitigation of geologic hazards and design considerations are incorporated into plans and implemented during construction.

Potential unstable geologic conditions related to lateral spreading and liquefaction are addressed under Impact GEO-1 and GEO-2, above.

Slope stability hazards are addressed through commonly used hillside grading procedures such as debris benches and setback areas, as discussed in MM GEO-3. Benches would be constructed into original slope grade as filling proceeds every 2 feet vertically, to remove loose soil and rock. General fill areas would adhere to the compaction control requirements outlined in ASTM D-1557 standard. Furthermore, the United States Geological Survey (USGS) and the ABAG Resilience Program has mapped the area to have low susceptibility for liquefaction. Existing landslide deposits within any proposed grading envelope would be mitigated by MM GEO-3 and corrective grading as described in MM GEO-1b, which would remove unstable soils down to in-place bedrock within the envelope of proposed improvements. The soils on the project site, as well as the geologic conditions on- and off-site, would not result in the potential for landslide, lateral spreading, subsidence, liquefaction or collapse.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement MM GEO-1b and the following:

**MM GEO-3** The contractor shall key and bench where fill is placed on original grade with a gradient of 6:1 or steeper. A minimum 24-foot-wide keyway inward from the toe of the new fill slope shall be constructed as shown on Figure 10 of the Geotechnical Feasibility Report in Appendix E. Extension of the keyway at least 3 feet below original grade into firm competent soil/rock shall be approved by a Geotechnical Engineer. Benches shall be cut into original grade after the keyway has been nearly filled with compacted engineered fill. Benches shall be constructed into original slope grade as filling proceeds every 2 feet vertically, to remove loose soil/rock. Deeper bench depths may be required depending on actual conditions observed during construction. Bench widths will vary depending on the original slope grade and actual bench depth. Buildings shall be set back from the top of slope in accordance with CBC requirements. Alternatively, deep foundations such as pier-and-grade-beam foundations should be anticipated for buildings close to the top of slopes.

### *Level of Significance After Mitigation*

Less than significant impact.

## Expansive Soil

**Impact GEO-4:** **The project would be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), potentially creating substantial risks to life or property.**

### *Impact Analysis*

The project site is underlain with Colluvium and Alluvium. During site reconnaissance and laboratory testing, colluvial deposits were found to range from silty clay to sandy clay with some fine gravel. Based on the findings of the geotechnical exploration and data by others, the colluvium appears to range up to about 16 feet in thickness. Alluvial topsoil identified as Rincon loam has neutral to mild alkalinity and very plastic characteristics, while Pleasanton gravelly loam in the southern portion of the project site consists of alluvium derived from sandstone and shale. The laboratory test results indicate that the surficial soils have low to high plasticity and corresponding moderate to high expansion potential. The USDA maps residual soil as Linne clay loam, predominantly of dark brown, silty or sandy clay. The residual soil appears to be dry and hard without significant porosity. Based on visual examination, residual soil appeared to have moderate to high plasticity and may be highly expansive. However, conventional grading operations, incorporating fill placement specifications tailored to the expansive characteristics of the soil, and use of a mat foundation (either post-tensioned or conventionally reinforced) are common, generally cost-effective measures to address the expansive potential of the foundation soils. Implementation of MM GEO-1a and MM GEO-1b would address impacts related to potentially unstable geologic conditions and reduce impacts to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement MMs GEO-1a and MM GEO-1b.

### *Level of Significance After Mitigation*

Less than significant impact.

## Wastewater Disposal Systems

**Impact GEO-5:** **The project would not use septic tanks or alternative wastewater disposal systems.**

### *Impact Analysis*

The project site is located across from a developed residential area in the City of Pleasanton, which is well-served by the municipal sanitary sewer system. The project would be served by an 8-inch sanitary sewer line that would connect to an existing 8-inch line on Alisal Street. There is also an existing 8-inch sanitary sewer line on Westbridge Lane. Therefore, the project would not use septic tanks or any alternative wastewater disposal system, and impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# 3.6 - Greenhouse Gas Emissions

## 3.6.1 - Introduction

This section describes the existing greenhouse gas (GHG) emissions setting and potential effects from Project implementation on the Project site and its surrounding area. Descriptions and analysis in this section are based on modeling performed by FirstCarbon Solutions (FCS). The most recent version of CalEEMod (version 2016.3.2) was used to quantify project-related GHG emissions. Complete modeling output is provided in Appendix B. This analysis follows the Bay Area Air Quality Management District (BAAQMD) and City of Pleasanton recommendations for preparing a GHG analysis under CEQA.

## 3.6.2 - Environmental Setting

Gases that trap heat in the atmosphere are referred to as GHGs. The effect is analogous to the way a greenhouse retains heat. Common GHGs include water vapor, carbon dioxide, methane, oxides of nitrogen ($NO_X$), chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, ozone, and aerosols. Natural processes and human activities emit GHGs. The presence of GHGs in the atmosphere affects the earth's temperature. It is believed that emissions from human activities, such as electricity production and vehicle use, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations.

Climate change is driven by forcing and feedbacks. Radiative forcing is the difference between the incoming energy and outgoing energy in the climate system. Positive forcing tends to warm the surface while negative forcing tends to cool it. Radiative forcing values are typically expressed in watts per square meter. A feedback is a climate process that can strengthen or weaken a forcing. For example, when ice or snow melts, it reveals darker land underneath which absorbs more radiation and causes more warming. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere. The global warming potential of a gas is essentially a measurement of the radiative forcing of a GHG compared with the reference gas, carbon dioxide ($CO_2$).

Individual GHG compounds have varying global warming potential and atmospheric lifetimes. $CO_2$, the reference gas for global warming potential, has a global warming potential of one. The global warming potential of a GHG is a measure of how much a given mass of a GHG is estimated to contribute to global warming. To describe how much global warming a given type and amount of GHG may cause, the carbon dioxide equivalent is used. The calculation of the carbon dioxide equivalent is a consistent methodology for comparing GHG emissions since it normalizes various GHG emissions to a consistent reference gas, $CO_2$. For example, $CH_4$'s warming potential of 21 indicates that $CH_4$ has 21 times greater warming effect than $CO_2$ on a molecule-per-molecule basis. A carbon dioxide equivalent is the mass emissions of an individual GHG multiplied by its global warming potential. GHGs defined by Assembly Bill (AB) 32 (see the Climate Change Regulatory Environment section for a description) include $CO_2$, methane ($CH_4$), $NO_X$, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. They are described in Table 3.6-1. A seventh GHG, nitrogen trifluoride, was added to Health and Safety Code section 38505(g)(7) as a GHG of concern.

## Table 3.6-1: Description of Greenhouse Gases

| Greenhouse Gas | Description and Physical Properties | Sources |
|---|---|---|
| Nitrous oxide | Nitrous oxide (laughing gas) is a colorless GHG. It has a lifetime of 114 years. Its global warming potential is 310. | Microbial processes in soil and water, fuel combustion, and industrial processes. |
| Methane | Methane is a flammable gas and is the main component of natural gas. It has a lifetime of 12 years. Its global warming potential is 21. | Methane is extracted from geological deposits (natural gas fields). Other sources are landfills, fermentation of manure, and decay of organic matter. |
| Carbon dioxide | Carbon dioxide ($CO_2$) is an odorless, colorless, natural GHG. Carbon dioxide's global warming potential is 1. The concentration in 2005 was 379 parts per million (ppm), which is an increase of about 1.4 ppm per year since 1960. | Natural sources include decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources are from burning coal, oil, natural gas, and wood. |
| Chlorofluorocarbons | These are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. They are nontoxic, nonflammable, insoluble, and chemically unreactive in the troposphere (the level of air at the earth's surface). Global warming potentials range from 3,800 to 8,100. | Chlorofluorocarbons were synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone. The Montreal Protocol on Substances that Deplete the Ozone Layer prohibited their production in 1987. |
| Hydrofluorocarbons | Hydrofluorocarbons are a group of GHGs containing carbon, chlorine, and at least one hydrogen atom. Global warming potentials range from 140 to 11,700. | Hydrofluorocarbons are synthetic manmade chemicals used as a substitute for chlorofluorocarbons in applications such as automobile air conditioners and refrigerants. |
| Perfluorocarbons | Perfluorocarbons have stable molecular structures and only break down by ultraviolet rays about 60 kilometers above Earth's surface. Because of this, they have long lifetimes, between 10,000 and 50,000 years. Global warming potentials range from 6,500 to 9,200. | Two main sources of perfluorocarbons are primary aluminum production and semiconductor manufacturing. |
| Sulfur hexafluoride | Sulfur hexafluoride ($SF_6$) is an inorganic, odorless, colorless, and nontoxic, nonflammable gas. It has a lifetime of 3,200 years. It has a high global warming potential, 23,900. | This gas is man-made and used for insulation in electric power transmission equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas. |
| Nitrogen trifluoride | Nitrogen trifluoride ($NF_3$) was added to Health and Safety Code section 38505(g)(7) as a GHG of concern. It has a high global warming potential of 17,200. | This gas is used in electronics manufacture for semiconductors and liquid crystal displays. |
| Sources: Compiled from a variety of sources, primarily Intergovernmental Panel on Climate Change 2007a and 2007b. | | |

The State has begun the process of addressing pollutants referred to as short-lived climate pollutants. The short-lived climate pollutants include three main components: black carbon, fluorinated gases, and methane. Fluorinated gases and methane are described in Table 3.6-1 and are already included in the California GHG inventory. Black carbon has not been included in past GHG inventories; however, ARB will include it in its comprehensive strategy (ARB 2015c).[1]

Senate Bill 605, approved by the Governor on September 14, 2014 required the ARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants by January 1, 2016. The ARB released the Proposed Short-Lived Climate Pollutant Reduction Strategy in April 2016. ARB has completed an emission inventory of these pollutants, identified research needs, identified existing and potential new control measures that offer co-benefits, and coordinated with other state agencies and districts to develop measures.

Black carbon is a component of fine particulate matter. Black carbon is formed by incomplete combustion of fossil fuels, biofuels, and biomass. Sources of black carbon within a jurisdiction may include exhaust from diesel trucks, vehicles, and equipment, as well as smoke from biogenic combustion. Biogenic combustion sources of black carbon include the burning of biofuels used for transportation, the burning of biomass for electricity generation and heating, prescribed burning of agricultural residue, and natural and unnatural wildfires. Black carbon is not a gas but an aerosol—particles or liquid droplets suspended in air. Black carbon only remains in the atmosphere for days to weeks, whereas other GHGs can remain in the atmosphere for years. Black carbon can be deposited on snow, where it absorbs sunlight, reduces sunlight reflectivity, and hastens snowmelt. Direct effects include absorbing incoming and outgoing radiation; indirectly, black carbon can also affect cloud reflectivity, precipitation, and surface dimming (cooling).

Global warming potentials for black carbon were not defined by the IPCC in its Fourth Assessment Report. The ARB has identified a global warming potential of 3,200 using a 20-year time horizon and 900 using a 100-year time horizon from the IPCC Fifth Assessment. Sources of black carbon are already regulated by ARB, and air district criteria pollutant and toxic regulations that control fine particulate emissions from diesel engines and other combustion sources (ARB 2015c).[2] Additional controls on the sources of black carbon specifically for their GHG impacts beyond those required for toxic and fine particulates are not likely to be needed.

Ozone is another short-lived climate pollutant that will be part of the strategy. Ozone affects evaporation rates, cloud formation, and precipitation levels. Ozone is not directly emitted, so its precursor emissions, volatile organic compounds (VOC) and oxides of nitrogen ($NO_X$) on a regional scale and $CH_4$ on a hemispheric scale will be subject of the strategy (ARB 2015c).[3]

Water vapor is also considered a GHG. Water vapor is an important component of our climate system and is not regulated. Increasing water vapor leads to warmer temperatures, which causes more water vapor to be absorbed into the air. Warming and water absorption increase in a spiraling

[1] California Air Resources Board (ARB). 2015c. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: http://www.arb.ca.gov/cc/shortlived/concept_paper.pdf. Accessed June 3, 2017.
[2] California Air Resources Board (ARB). 2015c. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: http://www.arb.ca.gov/cc/shortlived/concept_paper.pdf. Accessed June 3, 2017.
[3] California Air Resources Board (ARB). 2015c. Short-Lived Climate Pollutant Reduction Strategy, Concept Paper. May. Website: http://www.arb.ca.gov/cc/shortlived/concept_paper.pdf. Accessed June 3, 2017.

cycle. Water vapor feedback can also amplify the warming effect of other GHGs, such that the warming brought about by increased carbon dioxide allows more water vapor to enter the atmosphere (NASA 2015).[4]

## Climate Change

Climate change is a change in the average weather of the earth that is measured by alterations in wind patterns, storms, precipitation, and temperature. These changes are assessed using historical records of temperature changes occurring in the past, such as during previous ice ages. Many of the concerns regarding climate change use this data to extrapolate a level of statistical significance specifically focusing on temperature records from the last 150 years (the Industrial Age) that differ from previous climate changes in rate and magnitude.

The United Nations Intergovernmental Panel on Climate Change (IPCC) constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. In its Fourth Assessment Report, the IPCC predicted that the global mean temperature change from 1990 to 2100, given six scenarios, could range from 1.1 degrees Celsius (°C) to 6.4°C. Regardless of analytical methodology, global average temperatures and sea levels are expected to rise under all scenarios (IPCC 2007).[5] The report also concluded that "[w]arming of the climate system is unequivocal," and that "[m]ost of the observed increase in global average temperatures since the mid-20$^{th}$ century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."

An individual project, like the Spotorno Ranch Project, cannot generate enough GHG emissions to effect a discernible change in global climate. However, the Project participates in the potential for global climate change by its incremental contribution of GHGs combined with the cumulative increase of all other sources of GHGs, which when taken together constitute potential influences on global climate change.

## Consequences of Climate Change in California

In California, climate change may result in consequences such as the following (from CCCC 2006 and Moser et al. 2009).[6,7]

- **A reduction in the quality and supply of water from the Sierra snowpack.** If heat-trapping emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much

[4] National Aeronautics and Space Administration (NASA). 2015. NASA—Global Climate Change, Vital Signs of a Planet. Website: http://climate.nasa.gov/causes/. Accessed August 21, 2016.

[5] Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller [eds.]). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Website: www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html. Accessed June 15, 2017.

[6] California Climate Change Center. (CCCC). 2006. Our Changing Climate, Assessing the Risks to California: A Summary Report from the California Climate Change Center. July 2006. CEC-500-2006-077. Website: www.scc.ca.gov/webmaster/ftp/pdf/climate_change /assessing_risks.pdf. Accessed August 17, 2015.

[7] Moser et al. 2009. Moser, Susie, Guido Franco, Sarah Pittiglio, Wendy Chou, Dan Cayan. 2009. The Future Is Now: An Update on Climate Change Science Impacts and Response Options for California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2008-071. Website: www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF. Accessed May 7, 2013.

as 70 to 90 percent. This can lead to challenges in securing adequate water supplies. It can also lead to a potential reduction in hydropower.

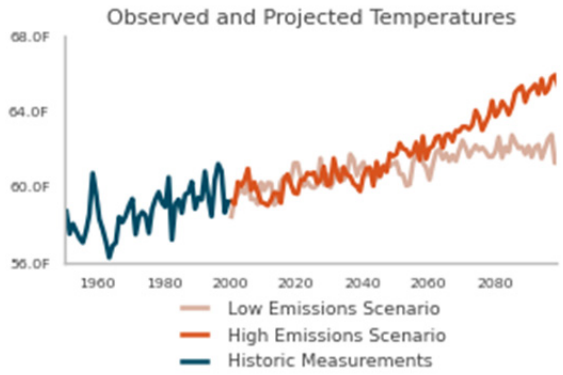
- **Increased risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grasslands and chaparral ecosystems of southern California are estimated to increase by approximately 30 percent toward the end of the 21st century because more winter rain will stimulate the growth of more plant "fuel" available to burn in the fall. In contrast, a hotter, drier climate could promote up to 90 percent more northern California fires by the end of the century by drying out and increasing the flammability of forest vegetation.
- **Reductions in the quality and quantity of certain agricultural products.** The crops and products likely to be adversely affected include wine grapes, fruit, nuts, and milk.
- **Exacerbation of air quality problems.** If temperatures rise to the medium warming range, there could be 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions. This is more than twice the increase expected if rising temperatures remain in the lower warming range. This increase in air quality problems could result in an increase in asthma and other health-related problems.
- **A rise in sea levels resulting in the displacement of coastal businesses and residences.** During the past century, sea levels along California's coast have risen about seven inches. If emissions continue unabated and temperatures rise into the higher anticipated warming range, sea level is expected to rise an additional 22 to 35 inches by the end of the century. Elevations of this magnitude would inundate coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats.
- **An increase temperature and extreme weather events.** Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in California. More heat waves can exacerbate chronic disease or heat-related illness.
- **A decrease in the health and productivity of California's forests.** Climate change can cause an increase in wildfires, an enhanced insect population, and establishment of non-native species.

## Consequences of Climate Change in Pleasanton

Figure 1 displays a chart of measured historical and projected annual average temperatures in the Pleasanton area. As shown in the figure, temperatures are expected to rise in the low and high GHG emissions scenarios. The results indicate that temperatures are predicted to increase by 3.5 degrees Fahrenheit (°F) under the low emission scenario and 5.9°F under the high emissions scenario.[8]

[8] CalAdapt. 2018. Local Climate Snapshots. Website: http://v1.cal-adapt.org/tools/factsheet/. Accessed March 30, 2018.

**Figure 1: Observed and Projected Temperatures for Climate Change in the City of Pleasanton Area**




Source: CalAdapt 2018[9]

## Human Health Effects of GHG Emissions

GHG emissions from development projects would not result in concentrations that would directly impact public health. However, the cumulative effects of GHG emissions on climate change have the potential to cause adverse effects to human health. The U.S. Global Change Research Program (2009),[10] has analyzed the degree to which impacts on human health are expected to impact the United States. Potential effects of climate change on public health include:

- **Direct Temperature Effects:** Climate change may directly affect human health through increases in average temperatures, which are predicted to increase the incidence of heat waves and hot extremes.
- **Extreme Events:** Climate change may affect the frequency and severity of extreme weather events, such as hurricanes and extreme heat and floods, which can be destructive to human health and well-being.
- **Climate–Sensitive Diseases:** Climate change may increase the risk of some infectious diseases, particularly those diseases that appear in warm areas and are spread by mosquitoes and other insects, such as malaria, dengue fever, yellow fever, and encephalitis.
- **Air Quality:** Respiratory disorders may be exacerbated by warming-induced increases in the frequency of smog (ground-level ozone) events and particulate air pollution (EPA 2009a).[11]

Although there could be health effects resulting from changes in the climate and the consequences that can occur, inhalation of GHGs at levels currently in the atmosphere would not result in adverse health effects, with the exception of ozone and aerosols (particulate matter). The potential health effects of ozone and particulate matter are discussed in criteria pollutant analyses. At very high

[9] CalAdapt. 2018. Local Climate Snapshots. Website: http://v1.cal-adapt.org/tools/factsheet/. Accessed March 30, 2018.
[10] U.S. Global Change Research Program. 2009. Global Climate Change Impacts in the U.S. Website: https://downloads.globalchange.gov/usimpacts/pdfs/climate-impacts-report.pdf. Accessed April 5, 2018.
[11] U.S. Environmental Protection Agency (EPA). 2009a. Ozone and your Health. EPA-456/F-09-001. Website: http://www.epa.gov/airnow/ozone-c.pdf. Accessed August 21, 2016.

indoor concentrations (not at levels existing outside), carbon dioxide, methane, sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen.[12,13]

## 3.6.3 - Regulatory Framework

### International Regulations

International organizations such as the ones discussed below have made substantial efforts to reduce GHGs. Preventing human-induced climate change will require the participation of all nations in solutions to address the issue.

**Intergovernmental Panel on Climate Change.** In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation.

**United Nations Framework Convention on Climate Change (Convention).** On March 21, 1994, the United States joined a number of countries around the world in signing the Convention. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices; launch national strategies for addressing GHG emissions and adapting to expected impacts, including the provision of financial and technological support to developing countries; and cooperate in preparing for adaptation to the impacts of climate change.

**Kyoto Protocol.** The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for 37 industrialized countries and the European community for reducing GHG emissions at average of five percent against 1990 levels over the five-year period from 2008–2012. The Convention (as discussed above) encouraged industrialized countries to stabilize emissions; however, the Protocol commits them to do so. Developed countries have contributed more emissions over the last 150 years; therefore, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."

In 2001, President George W. Bush indicated that he would not submit the treaty to the U.S. Senate for ratification, which effectively ended American involvement in the Kyoto Protocol. In December 2009, international leaders met in Copenhagen to address the future of international climate change commitments post-Kyoto. No binding agreement was reached in Copenhagen; however, the Committee identified the long-term goal of limiting the maximum global average temperature increase to no more than 2°C above pre-industrial levels, subject to a review in 2015. The UN Climate Change Committee held additional meetings in Durban, South Africa in November 2011; Doha, Qatar in November 2012; and Warsaw, Poland in November 2013. The meetings are gradually gaining consensus among participants on individual climate change issues.

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[12] Centers for Disease Control and Prevention (CDC). 2010. Department of Health and Human Services, the National Institute for Occupational Safety and Health. Carbon Dioxide. Website: www.cdc.gov/niosh/npg/npgd0103.html. Accessed February 14, 2017.

[13] Occupational Safety and Health Administration (OSHA). 2003. United States Department of Labor. Safety and Health Topics: Methane. Website: www.osha.gov/dts/chemicalsampling/data/CH_250700.html. Accessed August 21, 2016.

On September 23, 2014, more than 100 heads of state and government, and leaders from the private sector and civil society met at the Climate Summit in New York hosted by the United Nations. At the Summit, heads of government, business and civil society announced actions in areas that would have the greatest impact on reducing emissions, including climate finance, energy, transport, industry, agriculture, cities, forests, and building resilience.

**Paris Climate Change Agreement.** Parties to the U.N. Framework Convention on Climate Change (UNFCCC) reached a landmark agreement on December 12 in Paris, charting a fundamentally new course in the two-decade-old global climate effort. Culminating a 4-year negotiating round, the new treaty ends the strict differentiation between developed and developing countries that characterized earlier efforts, replacing it with a common framework that commits all countries to put forward their best efforts and to strengthen them in the years ahead. This includes, for the first time, requirements that all parties report regularly on their emissions and implementation efforts, and undergo international review.

The agreement and a companion decision by parties were the key outcomes of the conference, known as the 21st session of the UNFCCC Conference of the Parties, or COP 21. Together, the Paris Agreement and the accompanying COP decision:

- Reaffirm the goal of limiting global temperature increase well below 2 degrees Celsius, while urging efforts to limit the increase to 1.5 degrees;
- Establish binding commitments by all parties to make "nationally determined contributions" (NDCs), and to pursue domestic measures aimed at achieving them;
- Commit all countries to report regularly on their emissions and "progress made in implementing and achieving" their NDCs, and to undergo international review;
- Commit all countries to submit new NDCs every five years, with the clear expectation that they will "represent a progression" beyond previous ones;
- Reaffirm the binding obligations of developed countries under the UNFCCC to support the efforts of developing countries, while for the first time encouraging voluntary contributions by developing countries too;
- Extend the current goal of mobilizing $100 billion a year in support by 2020 through 2025, with a new, higher goal to be set for the period after 2025;
- Extend a mechanism to address "loss and damage" resulting from climate change, which explicitly will not "involve or provide a basis for any liability or compensation;"
- Require parties engaging in international emissions trading to avoid "double counting;" and
- Call for a new mechanism, similar to the Clean Development Mechanism under the Kyoto Protocol, enabling emission reductions in one country to be counted toward another country's NDC (C2ES 2015a).[14]

[14] Center for Climate and Energy Solutions (C2ES). 2015a. Outcomes of the U.N. Climate Change Conference. Website: http://www.c2es.org/international/negotiations/cop21-paris/summary. Accessed April 19, 2016.

On June 1, 2017, President Trump announced the decision for the United States to withdraw from the Paris Climate Accord (White House 2017).[15] California remains committed to combating climate change through programs aimed to reduce GHGs (ARB 2017).[16]

## Federal Regulations

Prior to the last decade, there were no concrete federal regulations of GHGs or major planning for climate change adaptation. Since then, federal activity has increased. The following are actions regarding the federal government, GHGs, and fuel efficiency.

**Greenhouse Gas Endangerment.** *Massachusetts v. EPA* (Supreme Court Case 05-1120) was argued before the United States (U.S.) Supreme Court on November 29, 2006, in which it was petitioned that the Environmental Protection Agency (EPA) regulate four GHGs, including carbon dioxide, under Section 202(a)(1) of the Clean Air Act (CAA). A decision was made on April 2, 2007, in which the Supreme Court found that GHGs are air pollutants covered by the CAA. The Court held that the Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the CAA:

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—$CO_2$, $CH_4$, $N_2O$, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations; and
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge, the U.S. Supreme Court declined to review an Appeals Court ruling upholding that upheld the EPA Administrator findings.

**Clean Vehicles.** Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the United States. On April 1, 2010, the EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the United States.

[15] The White House. Statement by President Trump on the Paris Climate Accord. Website: https://www.whitehouse.gov/the-press-office/2017/06/01/statement-president-trump-paris-climate-accord. Accessed June 23, 2017.

[16] California Air Resources Board (ARB). 2017. New Release: California and China Team Up to Push for Millions More Zero-emission Vehicles. Website: https://www.arb.ca.gov/newsreel/newsrelease.php?id=934. Accessed June 27, 2017.

The first phase of the national program would apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this $CO_2$ level solely through fuel economy improvements. Together, these standards would cut $CO_2$ emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking, establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012).[17] The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleet wide level of 163 grams/mile of $CO_2$ in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, which became effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that began in the 2014 model year and achieve up to a 20-percent reduction in $CO_2$ emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles, and a 15-percent reduction for diesel vehicles by 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10-percent reduction in fuel consumption and $CO_2$ emissions from the 2014 to 2018 model years.

**Mandatory Reporting of Greenhouse Gases.** The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of Greenhouse Gases Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the United States, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

**New Source Review.** The EPA issued a final rule on May 13, 2010 that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to

[17] U.S. Environmental Protection Agency (EPA). 2012. EPA and NHTSA Set Standards to Reduce Greenhouse Gases and Improve Fuel Economy for Model Years 2017-2025 Cars and Light Trucks. Website: http://www.epa.gov/otaq/climate/documents/420f12051.pdf. Accessed August 21, 2016.

limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the federal code of regulations, the EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to greenhouse gas sources, starting with the largest greenhouse gas emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for greenhouse gas emissions until at least April 30, 2016.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

**Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units.** As required by a settlement agreement, the EPA proposed new performance standards for emissions of carbon dioxide for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatt would be required to meet an output based standard of 1,000 pounds of carbon dioxide per megawatt-hour, based on the performance of widely used natural gas combined cycle technology.

**Cap-and-Trade.** Cap-and-trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. There is no federal GHG cap-and-trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap-and-trade. The Regional Greenhouse Gas Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps carbon dioxide emissions from power plants, auctions carbon dioxide emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners are California, British Columbia, Manitoba, Ontario, and Quebec. Currently only California and Quebec are participating in the cap-and-trade program (C2ES 2015b).[18]

[18] Center for Climate and Energy Solutions (C2ES). 2015b. Multi-State Climate Initiatives. Website: http://www.c2es.org/us-states-regions/regional-climate-initiatives. Accessed April 26, 2016.

## State Regulations

### *Legislative Actions to Reduce GHGs*

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark AB 32 California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

**AB 32.** The California State Legislature enacted AB 32, the California Global Warming Solutions Act of 2006. AB 32 requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "Greenhouse gases" as defined under AB 32 include carbon dioxide, methane, $NO_X$, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The ARB is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

The ARB approved the 1990 GHG emissions level of 427 million metric tons of carbon dioxide equivalents (MMT $CO_2e$) on December 6, 2007 (ARB 2007).[19] Therefore, to meet the State's target, emissions generated in California in 2020 are required to be equal to or less than 427 MMT $CO_2e$. Emissions in 2020 in a Business as Usual (BAU) scenario were estimated to be 596 MMT $CO_2e$, which do not account for reductions from AB 32 regulations (ARB 2008).[20] At that rate, a 28 percent reduction was required to achieve the 427 MMT $CO_2e$ 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the effects of the 2008 recession and slower forecasted growth. The 2020 inventory without the benefits of adopted regulation is now estimated at 545 MMT $CO_2e$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (ARB 2010a).[21]

### *Progress in Achieving AB 32 Targets and Remaining Reductions Required*

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories prepared by ARB for 2000

[19] California Air Resources Board (ARB). 2007. Staff Report. California 1990 Greenhouse Gas Level and 2020 Emissions Limit. November 16, 2007. Website: www.arb.ca.gov/cc/inventory/pubs/reports/staff_report_1990_level.pdf. Accessed February 14, 2017.

[20] California Air Resources Board (ARB). 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed February 14, 2017.

[21] California Air Resources Board (ARB). 2010a. 2020 Greenhouse Gas Emissions Projection and BAU Scenario Emissions Estimate. Website: http://www.arb.ca.gov/cc/inventory/archive/captrade_2010_projection.pdf. Accessed February 14, 2017.

through 2012 to show progress achieved to date (ARB 2014a).[22] The State has also achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target. Also shown are the average reductions needed from all statewide sources (including all existing sources) to reduce GHG emissions back to 1990 levels.

- 1990: 427 million MT $CO_2e$ (AB 32 2020 Target)
- 2000: 463 million MT $CO_2e$ (an average 8-percent reduction needed to achieve 1990 base)
- 2010: 450 million MT $CO_2e$ (an average 5-percent reduction needed to achieve 1990 base)
- 2020: 545 million MT $CO_2e$ BAU (an average 21.7-percent reduction from BAU needed to achieve 1990 base)

**ARB Scoping Plan**. The ARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32 (ARB 2008.)[23] The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. Capped strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the cap-and trade program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. Uncapped

[22] California Air Resources Board (ARB). 2014a. California Greenhouse Gas Emissions for 2000 to 2012—Trends of Emissions and Other Indicators. Website: http://www.arb.ca.gov/cc/inventory/pubs/reports/ghg_inventory_00-12_report.pdf. Accessed April 25, 2016.

[23] California Air Resources Board (ARB). 2008. (includes edits made in 2009) Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed February 14, 2017.

strategies that will not be subject to the cap-and-trade emissions caps and requirements are provided as a margin of safety by accounting for additional GHG emission reductions (ARB 2008).[24]

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities Climate for the next several years. The Update does not set new targets for the State, but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050.

### *Senate Bill 32 (SB 32)*

Effective January 1, 2017, SB 32 (Stats. 2016, ch. 249) added a new section 38566 to the Health and Safety Code. It provides that "[i]n adopting rules and regulations to achieve the maximum technologically feasible and cost-effective greenhouse gas emissions reductions authorized by [Division 25.5 of the Health and Safety Code], [ARB] shall ensure that statewide greenhouse gas emissions are reduced to at least 40 percent below the statewide greenhouse gas emissions limit no later than December 31, 2030." In other words, SB 32 requires California, by the year 2030, to reduce its statewide GHG emissions so that they are 40 percent below those that occurred in 1990.

The 2017 Climate Change Scoping Plan Update addressing the SB 32 targets was adopted on December 14, 2017. The major elements of the framework proposed to achieve the 2030 target are as follows:

1. SB 350
   - Achieve 50 percent Renewables Portfolio Standard (RPS) by 2030.
   - Doubling of energy efficiency savings by 2030.
2. Low Carbon Fuel Standard (LCFS)
   - Increased stringency (reducing carbon intensity 18 percent by 2030, up from 10 percent in 2020).
3. Mobile Source Strategy (Cleaner Technology and Fuels Scenario)
   - Maintaining existing GHG standards for light- and heavy-duty vehicles.
   - Put 4.2 million zero-emission vehicles (ZEVs) on the roads.
   - Increase ZEV buses, delivery and other trucks.
4. Sustainable Freight Action Plan
   - Improve freight system efficiency.
   - Maximize use of near-zero emission vehicles and equipment powered by renewable energy.
   - Deploy over 100,000 zero-emission trucks and equipment by 2030.

[24] California Air Resources Board (ARB). 2008. (Includes edits made in 2009) Climate Change Scoping Plan, a framework for change. Website: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Accessed February 14, 2017.

5. Short-Lived Climate Pollutant (SLCP) Reduction Strategy
   - Reduce emissions of methane and hydrofluorocarbons 40 percent below 2013 levels by 2030.
   - Reduce emissions of black carbon 50 percent below 2013 levels by 2030.
6. SB 375 Sustainable Communities Strategies
   - Increased stringency of 2035 targets.
7. Post-2020 Cap-and-Trade Program
   - Declining caps, continued linkage with Québec, and linkage to Ontario, Canada.
   - ARB will look for opportunities to strengthen the program to support more air quality co-benefits, including specific program design elements. In Fall 2016, ARB staff described potential future amendments including reducing the offset usage limit, redesigning the allocation strategy to reduce free allocation to support increased technology and energy investment at covered entities and reducing allocation if the covered entity increases criteria or toxics emissions over some baseline.
8. 20 percent reduction in greenhouse gas emissions from the refinery sector.
9. By 2018, develop Integrated Natural and Working Lands Action Plan to secure California's land base as a net carbon sink (ARB 2017c).

Between AB 32 (2006) and SB 32 (2016), the Legislature has codified some of the ambitious GHG reduction targets included within certain high-profile Executive Orders issued by the last two Governors. The 2020 statewide GHG reduction target in AB 32 was consistent with the second of three statewide emissions reduction targets set forth in former Governor Arnold Schwarzenegger's 2005 Executive Order known as S-3-05, which is expressly mentioned in AB 32. (See Health & Saf. Code, § 38501, subd. (i).) That Executive Branch document included the following GHG emission reduction targets: by 2010, reduce GHG emissions to 2000 levels; by 2020, reduce GHG emissions to 1990 levels; by 2050, reduce GHG emissions to 80 percent below 1990 levels. To meet the targets, the Governor directed several state agencies to cooperate in the development of a climate action plan. The Secretary of CalEPA leads the Climate Action Team (CAT), whose goal is to implement global warming emission reduction programs identified in the Climate Action Plan and to report on the progress made toward meeting the emission reduction targets established in the executive order.

In 2015, Governor Brown issued another Executive Order, B-30-15, which created a "new interim statewide greenhouse gas emission reduction target to reduce greenhouse gas emissions to 40 percent below 1990 levels by 2030 is established in order to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050." SB 32 codified this target.

Notably, the Legislature has not yet set a 2050 target in the manner done for 2020 and 2030 through AB 32 and SB 32, though references to a 2050 target can be found in statutes outside the Health and Safety Code. In the 2015 legislative session, the Legislature passed SB 350 (Stats. 2015, ch. 547) (discussed in more detail below). This legislation added language to the Public Utilities Code that essentially puts into statute the 2050 GHG reduction target already identified in Executive Order S-3-05, albeit in the limited context of new state policies (i) increasing the overall share of electricity that

must be produced through renewable energy sources and (ii) directing certain state agencies to begin planning for the widespread electrification of the California vehicle fleet. Section 740.12(a)(1)(D) of the Public Utilities Code now states that "[t]he Legislature finds and declares [that] . . . [r]educing emissions of [GHGs] to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050 will require widespread transportation electrification." Furthermore, Section 740.12(b) now states that the California Public Utilities Commission (PUC), in consultation with ARB and the California Energy Commission (CEC), must "direct electrical corporations to file applications for programs and investments to accelerate widespread transportation electrification to reduce dependence on petroleum, meet air quality standards, . . . and reduce emissions of greenhouse gases to 40 percent below 1990 levels by 2030 and to 80 percent below 1990 levels by 2050."

**Cap-and-Trade Program**. The Cap-and-Trade Program is a key element of the Scoping Plan. It sets a statewide limit on sources responsible for 85 percent of California's GHG emissions, and establishes a price signal needed to drive long-term investment in cleaner fuels and more efficient use of energy. The program is designed to provide covered entities the flexibility to seek out and implement the lowest cost options to reduce emissions. The program conducted its first auction in November 2012. Compliance obligations began for power plants and large industrial sources in January 2013. Other significant milestones include linkage to Quebec's cap-and-trade system in January 2014 and starting the compliance obligation for distributors of transportation fuels, natural gas, and other fuels in January 2015.[25]

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by ARB in the First Update:

> The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative.[26]

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions

[25] California Air Resources Board (ARB). 2015. ARB Emissions Trading Program. Website: http://www.arb.ca.gov/cc/capandtrade/guidance/cap_trade_overview.pdf. Accessed February 14, 2017.

[26] California Air Resources Board (ARB). 2014b. First Update to the Climate Change Scoping Plan. Website: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed February 14, 2017.

reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions reductions. Thus, the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by ARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures.[27]

**SB 375—the Sustainable Communities and Climate Protection Act of 2008.** Senate Bill (SB) 375 was signed into law on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings determinations for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the greenhouse gas emission reduction targets;
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies); and
3. Incorporates the mitigation measures required by an applicable prior environmental document.

[27] California Air Resources Board (ARB). 2014b. First Update to the Climate Change Scoping Plan. Website: http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm. Accessed February 14, 2017.

**AB 1493 Pavley Regulations and Fuel Efficiency Standards.** California AB 1493, enacted on July 22, 2002, required the ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the by the U.S. District Court for the District of Columbia in 2011.[28]

The standards are to be phased in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in an approximately 22-percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30-percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.[29]

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will reduce pollutants from gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The regulations will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.[30]

**SB 1368—Emission Performance Standards.** In 2006, the State Legislature adopted SB 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a performance standard for GHG emissions for the future power purchases of California utilities. SB 1368 seeks to limit carbon emissions associated with electrical energy consumed in California by forbidding procurement arrangements for energy longer than 5 years from resources that exceed the emissions of a relatively clean, combined cycle natural gas power plant. Because of the carbon content of its fuel source, a coal-fired plant cannot meet this standard because such plants emit roughly twice as much carbon as natural gas, combined cycle plants. Accordingly, the new law effectively prevents California's utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. The California Public Utilities Commission adopted the regulations required by SB 1368 on August 29, 2007. The regulations implementing SB 1368 establish a standard for baseload generation owned by, or under long-term contract to publicly owned utilities, of 1,100 lbs $CO_2$ per megawatt-hour (MWh).

[28] California Air Resources Board (ARB). 2013d. Clean Car Standards—Pavley, Assembly Bill 1493. Website: http://www.arb.ca.gov/cc/ccms/ccms.htm. Accessed February 14, 2017.

[29] California Air Resources Board (ARB). 2013e. Facts About the Clean Cars Program. Website: http://www.arb.ca.gov/msprog/zevprog/factsheets/advanced_clean_cars_eng.pdf. Accessed February 14, 2017.

[30] California Air Resources Board (ARB). 2011c. Status of Scoping Plan Recommended Measures. Website: www.arb.ca.gov/cc/scoping plan/sp_measures_implementation_timeline.pdf. Accessed February 14, 2017.

**SB 1078—Renewable Electricity Standards.** On September 12, 2002, Governor Gray Davis signed SB 1078, requiring California to generate 20 percent of its electricity from renewable energy by 2017. SB 107 changed the due date to 2010 instead of 2017. On November 17, 2008, Governor Arnold Schwarzenegger signed Executive Order S-14-08, which established a Renewable Portfolio Standard target for California requiring that all retail sellers of electricity serve 33 percent of their load with renewable energy by 2020. Governor Schwarzenegger also directed the ARB (Executive Order S-21-09) to adopt a regulation by July 31, 2010, requiring the State's load serving entities to meet a 33 percent renewable energy target by 2020. The ARB Board approved the Renewable Electricity Standard on September 23, 2010 by Resolution 10-23.

**SB 350—Clean Energy and Pollution Reduction Act of 2015.** The legislature recently approved and the Governor signed SB 350 which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill due to opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States.[31]

**SBX 7-7—The Water Conservation Act of 2009**. The legislation directs urban retail water suppliers to set individual 2020 per capita water use targets and begin implementing conservation measures to achieve those goals. Meeting this statewide goal of 20 percent decrease in demand will result in a reduction of almost 2 million acre-feet in urban water use in 2020.

## Executive Orders Related to GHG Emissions

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the State and guide the actions of state agencies.

**Executive Order S-3-05.** Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce greenhouse gas emissions to 2000 levels.

[31] California Legislative Information (California Leginfo). 2015. Senate Bill 350 Clean Energy and Pollution Reduction Act of 2015. Website: https://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201520160SB350. Accessed September 28, 2017.

- By 2020, reduce greenhouse gas emissions to 1990 levels.
- By 2050, reduce greenhouse gas emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is an executive order, the goals are not legally enforceable for local governments or the private sector.

**Executive Order B-30-15**. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The executive order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050, and directs the ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of $MMCO_2e$. The executive order also requires the State's climate adaptation plan to be updated every three years and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this executive order is not legally enforceable against local governments and the private sector.

**Executive Order S-01-07—Low Carbon Fuel Standard.** The Governor signed Executive Order S 01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the executive order established a Low Carbon Fuel Standard (LCFS) and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The Low Carbon Fuel Standard was subject to legal challenge in 2011. Ultimately, on August 8, 2013, the Fifth District Court of Appeal (California) ruled that ARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for Low Carbon Fuel Standards. In a partially published opinion, the Court of Appeal directed that Resolution 09-31 and two executive orders of ARB approving LCFS regulations promulgated to reduce GHG emissions be set aside. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while ARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, ARB was required to bring a new LCFS regulation to the Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The second public hearing for the new LCFS regulation was held on September 24, 2015 and September 25, 2015, where the

LCFS Regulation was adopted. The Final Rulemaking Package adopting the regulation was filed with the Office of Administrative Law (OAL) on October 2, 2015. The OAL approved the regulation on November 16, 2015.[32]

**Executive Order S-13-08**. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the order, the 2009 California Climate Adaptation Strategy was adopted, which is the ". . . first statewide, multi-sector, region-specific, and information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

## California Regulations and Building Codes

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

**Title 20 Appliance Efficiency Regulations.** California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. Twenty-three categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the State and those designed and sold exclusively for use in recreational vehicles or other mobile equipment.[33]

**Title 24 Energy Efficiency Standards.** California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The 2016 Building Energy Efficiency Standards became effective on January 1, 2017.[34]

**Title 24 California Green Building Standards Code** (California Code of Regulations Title 24, Part 11 code) is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect January 1, 2011. The code is updated on a regular basis, with the most

[32] California Air Resources Board (ARB). 2015e. Low Carbon Fuel Standard Regulation. Website: http://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm. Accessed September 22, 2017.

[33] California Energy Commission (CEC). 2012. 2013 Title 24 Building Energy Efficiency Standards Adoption Hearing Presentation. Website: http://www.energy.ca.gov/title24/2013standards/rulemaking/documents/final_rulemaking_documents/31_2013_Adoption_Hearing_Presentation_5-31.pdf. Accessed October 19, 2015.

[34] California Energy Commission (CEC). 2016. 2016 Building Energy Efficiency Standards Frequently Asked Questions. Website: http://www.energy.ca.gov/title24/2016standards/rulemaking/documents/2016_Building_Energy_Efficiency_Standards_FAQ.pdf. Accessed December 1, 2016.

recent update consisting of the 2016 California Green Building Code Standards that became effective January 1, 2017. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. The Code recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they provide a minimum 50-percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. State building code provides the minimum standard that buildings need to meet in order to be certified for occupancy, which is generally enforced by the local building official. The California Green Building Standards Code (California Code of Regulations Title 24, Part 11 code) requires the following mandatory measures for new single-family residential development projects:

- **Construction waste**. A minimum 65-percent diversion of construction and demolition waste from landfills. (A5.408.3.1 [residential]).
- **Indoor water use.** Indoor water use in new residential development must meet standards for plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) (4.303.1). These standards limit the amount of water that can be released per unit of time or per use for water closets, showerheads, and faucets.
- **Materials pollution control**. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring and particleboard (4.504.2).

**Model Water Efficient Landscape Ordinance**. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881 Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected for Ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed DWR to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015, which became effective on December 15, 2015. New development projects that include landscaped areas of 500 square feet or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems
- Incentives for graywater usage
- Improvements in on-site stormwater capture
- Limiting the portion of landscapes that can be planted with high water use plants
- Reporting requirements for local agencies.

**SB 97 and the CEQA Guidelines Update.** Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)."

Section 21097 was also added to the Public Resources Code, which provided an exemption until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA. The Natural Resources Agency completed the approval process and the Amendments became effective on March 18, 2010.

The 2010 CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

Section 15064.4(b) of the CEQA Guidelines provides direction for lead agencies for assessing the significance of impacts of GHG emissions:

- The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
- Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; or
- The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The CEQA Guidelines amendments do not identify a threshold of significance for GHG emissions, nor do they prescribe assessment methodologies or specific mitigation measures. Instead, they call for a "good-faith effort, based on available information, to describe, calculate, or estimate the amount of greenhouse gas emissions resulting from a project." The amendments encourage lead agencies to consider many factors in performing a CEQA analysis and preserve lead agencies' discretion to make their own determinations based upon substantial evidence. The amendments also encourage public agencies to make use of programmatic mitigation plans and programs from which to tier when they perform individual project analyses.

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts, respectively. GHG mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze GHG emissions in an EIR when a project's incremental contribution of emissions may be cumulatively considerable; however, it does not answer the question of when emissions are cumulatively considerable.

Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of Greenhouse Gas Reduction Plans. Compliance with such plans can support a determination that a project's cumulative effect is not cumulatively considerable, according to Section 15183.5(b).

In addition, the amendments revised Appendix F of the CEQA Guidelines, which focuses on Energy Conservation. The sample environmental checklist in Appendix G was amended to include GHG questions.

CEQA emphasizes that the effects of GHG emissions are cumulative, and should be analyzed in the context of CEQA's requirements for cumulative impacts analysis (see CEQA Guidelines Section 15130(f)).

## California Supreme Court GHG Ruling

In a November 30, 2015 ruling, the California Supreme Court in *Center for Biological Diversity (CBD) v. California Department of Fish and Wildlife* (CDFW) on the Newhall Ranch project concluded that whether the project was consistent with meeting statewide emission reduction goals is a legally permissible criterion of significance, but the significance finding for the project was not supported by a reasoned explanation based on substantial evidence. The Court offered potential solutions on pages 25–27 of the ruling to address this issue summarized below:

Specifically, the Court advised that:

- **Substantiation of Project Reductions from BAU**. A lead agency may use a BAU comparison based on the Scoping Plan's methodology if it also substantiates the reduction a particular project must achieve to comply with statewide goals. The Court suggested a lead agency could examine the "data behind the Scoping Plan's business-as-usual model" to determine the necessary project-level reductions from new land use development at the proposed location (p. 25).
- **Compliance with Regulatory Programs or Performance Based Standards**. A lead agency "might assess consistency with A.B. 32's goal in whole or part by looking to compliance with regulatory programs designed to reduce greenhouse gas emissions from particular activities. (See Final Statement of Reasons, supra, at p. 64 [greenhouse gas emissions 'may be best analyzed and mitigated at a programmatic level.'].)" To the extent a project's design features comply with or exceed the regulations outlined in the Scoping Plan and adopted by the Air Resources Board or other state agencies, a lead agency could appropriately rely on their use as showing compliance with 'performance based standards' adopted to fulfill 'a statewide . . . plan for the reduction or mitigation of greenhouse gas emissions' (CEQA Guidelines § 15064.4(a)(2), (b)(3); see also id., § 15064(h)(3) [determination that impact is not cumulatively considerable may rest on compliance with previously adopted plans or regulations, including 'plans or regulations for the reduction of greenhouse gas emissions']) (p. 26).
- **Compliance with GHG Reduction Plans or Climate Action Plans (CAPs)**. A lead agency may utilize "geographically specific GHG emission reduction plans" such as climate action plans or

greenhouse gas emission reduction plans to provide a basis for the tiering or streamlining of project-level CEQA analysis (p. 26).

- **Compliance with Local Air District Thresholds**. A lead agency may rely on "existing numerical thresholds of significance for greenhouse gas emissions" adopted by, for example, local air districts (p. 27).

Therefore, consistent with CEQA Guidelines Appendix G, the three factors identified in CEQA Guidelines Section 15064.4 and the recently issued Newhall Ranch opinion, the GHG impacts would be considered significant if the Project would:

- Conflict with a compliant GHG Reduction Plan if adopted by the lead agency;
- Exceed the applicable GHG Reduction Threshold; or
- Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emission of GHGs.

### Local

#### *City of Pleasanton General Plan*

The City of Pleasanton General Plan includes the policies related to improving air quality and climate change impacts in its Air Quality and Climate Change Element. The same policies listed in the Section 3.2.3 of the Air Quality Section would also be relevant to reducing GHG emissions.

#### *Local GHG Regulations*

The City of Pleasanton Climate Action Plan (City of Pleasanton 2012) was adopted in 2012. This Climate Action Plan included a GHG inventory for current year and a forecast for 2020 for the City of Pleasanton, and identified GHG reduction measures that could be implemented in order to substantially reduce GHG emissions and meet the goal of 15 percent below its 2005 community-wide baseline. This reduction would result in 1990 levels of GHGs by 2020.

## 3.6.4 - Methodology for Assessing Greenhouse Gas Impacts

### Model Selection and Guidance

The California Emissions Estimator Model (CalEEMod) version 2016.3.2 was used to estimate the project's construction and operation-related GHG emissions. CalEEMod was developed in cooperation with air districts throughout the State and is designed as a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential GHG emissions associated with construction and operation from a variety of land uses.

### Greenhouse Gases Assessed

This analysis is restricted to GHGs identified by AB 32, which include $CO_2$, $CH_4$, $N_2O$, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The project would primarily generate $CO_2$, $CH_4$, and $N_2O$ resulting from fossil fuel combustion.

The project may emit GHGs that are not defined by AB 32. For example, the project may generate aerosols through emissions of DPM from the vehicles and trucks that would access the project site. Aerosols are short-lived particles, as they remain in the atmosphere for about one week. Black carbon is a component of aerosol. Studies have indicated that black carbon has a high global warming potential; however, the Intergovernmental Panel on Climate Change states that its global warming potential has a low level of scientific certainty.[35]

Water vapor could be emitted from evaporated water used for landscaping, but this is not a significant impact because water vapor concentrations in the upper atmosphere are primarily due to climate feedbacks rather than emissions from project-related activities. The project would emit $NO_X$ and VOC, which are ozone precursors. Ozone is a GHG; however, unlike the other GHGs, ozone in the troposphere is relatively short-lived and can be reduced in the troposphere on a daily basis. Stratospheric ozone can be reduced through reactions with other pollutants.

Certain GHGs defined by AB 32 would not be emitted by the project. Perfluorocarbons and sulfur hexafluoride are typically used in industrial applications, none of which would be used by the project. Therefore, it is not anticipated that the project would emit perfluorocarbons or sulfur hexafluoride.

An upstream emission source (also known as life cycle emissions) refers to emissions that were generated during the manufacture of products to be used for construction of the project. Upstream emission sources for the project include but are not limited emissions from the manufacture of cement, emissions from the manufacture of steel, and/or emissions from the transportation of building materials to the seller. The upstream emissions were not estimated because they are not within the control of the project and to do so would be speculative. Additionally, the California Air Pollution Control Officers Association White Paper on CEQA and Climate Change supports this conclusion by stating, "The full life-cycle of GHG [greenhouse gas] emissions from construction activities is not accounted for . . . and the information needed to characterize [life-cycle emissions] would be speculative at the CEQA analysis level" (CAPCOA 2008).[36] Therefore, pursuant to CEQA Guidelines Sections 15144 and 15145, upstream/life cycle emissions are speculative and no further discussion is necessary.

## Construction

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from on-site and off-site activities. On-site GHG emissions principally consist of exhaust emissions from heavy-duty construction equipment. Off-site GHG emissions would occur from motor vehicle exhaust from material delivery vehicles and construction worker traffic.

[35] Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller [eds.]). Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Website: www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html. Accessed June 15, 2017.

[36] California Air Pollution Control Officers Association. 2008. CEQA & Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act. Available: http://www.capcoa.org/wp-content/uploads /2012/03/CAPCOA-White-Paper.pdf. Accessed: December 18, 2011.

As discussed in Section 3.2, Air Quality, the construction parameters used to estimate the project's construction-related emissions were based on applicant-provided data and CalEEMod default-provided assumptions. Full assumptions are detailed in the CalEEMod output contained in Appendix B.

## Operation

Operational GHG emissions are those GHG emissions that occur during operation of the project. The major sources are summarized below.

### *Motor Vehicles*

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the project site. The emissions were estimated using the CalEEMod model (version 2016.3.2). The average daily trip generation rates (the number of trips to and from the project each day) for project operations were obtained from the project-specific traffic analysis performed by Fehr & Peers and are consistent with Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 10th Edition. The Transportation Assessment (Fehr & Peers 2018), included trip rates for weekday and Saturday. As a conservative assumption, Saturday trip rates were applied to all weekend trips in the GHG analysis.

Pass-by trips are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. Pass-by trips are not diverted from another roadway. The CalEEMod model default pass-by trips were used for this analysis.

The CalEEMod model defaults pass-by trips were used for this analysis. The CalEEMod model default trip lengths for an urban setting for Alameda County were used in this analysis. The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline and diesel-powered vehicles). The CalEEMod model default vehicle fleet mix and emission factors for Alameda County were used for this analysis.

### *Architectural Coatings*

Paints release VOC emissions during application and drying. The buildings in the project would be repainted on occasion. The CalEEMod model defaults were used for this purpose.

### *Consumer Products*

Consumer products are various solvents used in non-industrial applications, which emit VOC during their product use. "Consumer Product" means a chemically formulated product used by household and institutional consumers, including but not limited to detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products, but it does not include other paint products, furniture coatings, or architectural coatings.[37] The default emission factor developed for the CalEEMod model was used.

[37] California Air Resources Board (ARB). 2011b. Regulation for Reducing Emissions from Consumer Products. Website:

### *Landscape Equipment*

The landscaping equipment (leaf blowers, chain saws, mowers) would generate GHG emissions as a result of fuel combustion based on assumptions in the CalEEMod model.

### *Electricity*

Pacific Gas & Electric (PG&E) provides estimates of its GHG emission factors per megawatt hour of electricity delivered to its customers. The PG&E emissions factor for 2020 for $CO_2$ is provided below. The rates for methane and nitrous oxide are based on compliance with the Renewable Portfolio Standard. The factors listed below were applied in estimating project emissions for the year 2020.

- Carbon dioxide: 491.65 lbs/MWh
- Methane: 0.022 lb/MWh
- Nitrous oxide: 0.005 lb/MWh

### *Title 24*

CalEEMod has three categories for electricity consumption: electricity that is impacted by Title 24 regulations; non-Title 24 electricity; and lighting. The Title 24 uses are defined as the major building envelope systems covered by California's Building Code Title 24 Part 6, such as space heating, space cooling, water heating, and ventilation. Lighting is separate since it can be both part and not part of Title 24. Since lighting is not part of the building envelope energy budget, the CalEEMod model does not consider lighting to have any further association with Title 24 references in the program. Non-Title 24 includes everything else such as appliances and electronics. To properly divide the total electricity consumption into the three categories, the percentage for each category is determined by using percentages derived from the CalEEMod model default electricity intensity. The percentages are applied to the electricity consumption to obtain the values used in the analysis.

In addition, the 2016 Title 24 standards became effective on January 1, 2017, and are approximately 28 percent more efficient than the previous 2013 Title 24 standards for residential buildings. Title 24 reductions for 2016 are accounted for in version 2016.3.2 of the CalEEMod model.

### *Natural Gas*

There would be emissions from the combustion of natural gas used for the project (water heaters, heat, etc.). The CalEEMod model has two categories for natural gas consumption: Title 24 and non-Title 24. The CalEEMod model defaults were used.

### *Water and Wastewater*

There would be emissions from the combustion of natural gas used for the project (water heaters, heat, etc.). The CalEEMod model has two categories for natural gas consumption: Title 24 and non-Title 24. The CalEEMod model defaults were used.

https://www.arb.ca.gov/consprod/regs/2015/article_2_final_1-22-15.pdf. Accessed September 22, 2017.

### *Solid Waste*

GHG emissions would be generated from the decomposition of solid waste generated by the project. The CalEEMod model was used to estimate the GHG emissions from this source. The CalEEMod model default for the mix of landfill types is as follows:

- Landfill no gas capture—6%;
- Landfill capture gas flare—94%;
- Landfill capture gas energy recovery—0%.

### *Vegetation*

There is currently carbon sequestration occurring on-site from existing vegetation. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 31 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acres) contains hilly terrain with steep slopes. The project would consist of the development of 39 single-family residences on approximately 31 acres and permanently preserve approximately 80 acres as open space. The open space is located east of the Spotorno Flat Area, within the hilly portion of the project site and includes three wetlands. In addition, the project would plant trees and integrate landscaping into the project design, which would provide carbon sequestration. However, data are insufficient to accurately determine the impact that existing plants have on carbon sequestration. For this analysis, it was assumed that the loss and addition of carbon sequestration that are due to the project would be balanced; therefore, emissions due to carbon sequestration were not included.

## 3.6.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether greenhouse emissions impacts are significant environmental effects, the following questions are analyzed and evaluated. Would the Project:

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? (See Impact GHG-1 below.)

b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases? (See Impact GHG-2 below.)

While the final determination of whether or not a project is significant is within the purview of the lead agency pursuant to CEQA Guidelines Section 15064(b), the BAAQMD recommends that its quantitative and qualitative air pollution thresholds be used to determine the significance of project emissions. These thresholds are discussed under each impact section below.

### Happy Valley Specific Plan FEIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR did not evaluate GHG emissions because this analysis was

not a requirement at the time the FEIR was certified. Therefore, no mitigation measure were required. The following section evaluates potential impacts of the project as currently proposed.

## 3.6.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the project and provides mitigation measures where necessary.

### Greenhouse Gas Emissions

| | |
|---|---|
| **Impact GHG-1:** | **Implementation of the project would generate direct and indirect greenhouse gas emissions; however, these emissions would not result in a significant impact on the environment.** |

#### *Impact Analysis*

BAAQMD provides multiple options in its 2017 CEQA Guidelines for project-level GHG generation from project operation. BAAQMD does not presently provide a construction-related GHG generation threshold, but it does recommend that construction-generated GHGs be quantified and disclosed. BAAQMD also recommends that lead agencies (in this case, the City of Pleasanton) make a determination of the level of significance of construction-generated greenhouse gas emissions in relation to meeting AB 32 GHG reduction goals. The lead agency is also encouraged to incorporate best management practices to reduce GHG emissions during project construction, as feasible and applicable.

BAAQMD's project-level significances threshold for operational GHG generation was deemed appropriate to use when determining the project's potential GHG impacts. The thresholds suggested by BAAQMD for project-level operational GHG generation are as follows:

- Compliance with a qualified GHG Reduction Strategy, or
- 1,100 MT $CO_2$e/year, or
- 4.6 metric tons of $CO_2$ equivalent per service population (employees plus residents) per year.

BAAQMD's Air Quality Guidelines state that if annual emissions of GHG exceed the thresholds, the project would result in a cumulatively considerable significant impact to global climate change. Conversely, if the project is less than any one of the thresholds identified above, then the project would result in a less than significant cumulative impact to global climate change. The estimated annual operational emissions were compared with the 1,100 MT $CO_2$e/year significance threshold to determine significance for this criterion.

*Construction*

The project would emit GHG emissions during construction from the off-road equipment, worker vehicles, and any hauling that may occur. As previously indicated, BAAQMD does not presently provide a construction-related GHG generation threshold, but recommends that construction-generated GHGs be quantified and disclosed. BAAQMD also recommends that lead agencies (in this case, the City of Pleasanton) make a determination of the level of significance of construction-generated GHG emissions in relation to meeting AB 32 GHG reduction goals. Total GHG emissions

generated during all phases of construction were combined and are presented in Table 3.6-2. As a conservative estimate, construction was assumed to begin in October 2018 and be completed by December 2020. If the construction schedule moves to later years, construction emissions would decrease compared with the emissions generated during the anticipated schedule because of future improvements in technology and compliance with ongoing stringent regulatory requirements; therefore, the construction schedule used in this analysis represents a "worst-case" analysis scenario. In order to account for the construction emissions in assessing the project's GHG impacts, the total emissions generated during construction were amortized based on the life of the development (residential—50 years) and added to the operational emissions. As shown in Table 3.6-1, construction of the project is estimated to generate approximately 1,011 MT $CO_2e$. The amortized emissions from construction of 20.2 MT $CO_2e$ were added to the operational emissions to determine the total emissions of the project. These total project emissions were compared to the applicable BAAQMD significance threshold standard of 1,100 MT $CO_2e$ per year.

**Table 3.6-2: Unmitigated Construction Greenhouse Gas Emissions**

| Construction Phases | Total Emissions (MT $CO_2e$/year) |
|---|---|
| **2018** | |
| Site Preparation | 36.4 |
| Grading | 131.8 |
| Building Construction (2018) | 1.9 |
| *Total 2018 Construction Emissions* | *170.1* |
| **2019** | |
| Building Construction (2019) | 477.2 |
| *Total 2019 Construction Emissions* | *477.2* |
| **2020** | |
| Building Construction (2020) | 320.3 |
| Paving | 37.2 |
| Architectural Coating | 6.3 |
| *Total 2020 Construction Emissions* | *363.8* |
| **Total Construction Emissions** | **1,011.1** |
| **Construction Emissions Amortized Over the Life of the Project (50 years)** | **20.2** |
| Note:<br>Calculations use unrounded numbers.<br>Source: CalEEMod Output (see Appendix B). | |

*Operation*

Operational or long-term emissions occur over the life of the project. Sources for operational emissions include:

- **Motor Vehicles:** These emissions refer to GHG emissions contained in the exhaust from the cars and trucks that would travel to and from the project site.
- **Natural Gas:** These emissions refer to the GHG emissions that occur when natural gas is burned on the project site. Natural gas uses could include heating water, space heating, dryers, stoves, or other uses.
- **Indirect Electricity:** These emissions refer to those generated by off-site power plants to supply electricity required for the project.
- **Water Transport:** These emissions refer to those generated by the electricity required to transport and treat the water to be used on the project site.
- **Waste:** These emissions refer to the GHG emissions produced by decomposing waste generated by the project.

The analysis quantified annual emissions from the project for comparison to BAAQMD's threshold of 1,100 MT $CO_2e$ per year. Operational GHG emissions by source are shown in Table 3.6-3. Total annual operational emissions were estimated at approximately 564 MT $CO_2e$ assuming full buildout in the year 2020. As previously indicated, the analysis includes construction emissions amortized over the life of the project. The project would generate approximately 584 MT $CO_2e$ per year with the addition of amortized construction emissions.

**Table 3.6-3: Operational Greenhouse Gas Emissions (2020)**

| Emission Source | Project Total MT $CO_2e$ per year |
|---|---|
| Area | 2 |
| Energy | 132 |
| Mobile (Vehicles) | 398 |
| Waste | 24 |
| Water | 8 |
| *Total Project Operational Emissions* | *564* |
| *Annualized Construction Emissions* | *20* |
| **Total Project Emissions** | **584** |
| **BAAQMD Threshold** | **1,100** |
| **Does project exceed threshold?** | **No** |
| Notes:<br>MT $CO_2e$ = metric tons of carbon dioxide equivalent.<br>Source of Emissions: CalEEMod Output (see Appendix B) | |

As shown in Table 3.6-3 the project's long-term operational emissions would not exceed the BAAQMD's threshold of significance. Therefore, the project's GHG emissions would be less than significant.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

## Greenhouse Gas Reduction Plan Consistency

**Impact GHG-2: Implementation of the project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of greenhouse gases.**

### *Impact Analysis*

Significance for this impact is determined by project compliance with the City of Pleasanton Climate Action Plan (CAP),[38] which is a qualified GHG Reduction Plan according to the BAAQMD's 2017 guidelines.[39] The City's CAP identifies policies that will achieve the State-recommended GHG reduction target of 15 percent below 2008 levels by the year 2020 and the locally adopted reduction goal of 15 percent below 2005 levels by 2020. The CAP provides goals, supporting strategies, and associated actions in the topical areas of energy, land use and transportation, solid waste minimization, water and wastewater, and community engagement. To assess compliance with the City's CAP, a consistency analysis was performed for applicable requirements and is discussed below.

**Table 3.6-4: Project Consistency with Applicable GHG Reduction Goals and Supporting Actions from the City of Pleasanton CAP**

| Applicable Goals and Supporting Actions | Project Consistency |
|---|---|
| **Energy** | |
| **Goal 1:** Reduce Energy Used by the Community | **Consistent.** The State of California has adopted several regulations that will help the City achieve its reduction goal and are applicable to the project. The project would be subject to the latest Title 24 energy efficiency standards. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas emissions. Emissions related to electricity consumption by the project would be further reduced as the electric utility complies with the |
| **Supporting Action EC1-2:** Implement the 2006 residential Green Building Ordinance requiring new and significantly remodeled residential buildings to incorporate measures from Build It Green (BIG) green building guidelines. Continue to implement and update according to the California Green Building Standards Code, and include requirements for shade trees and cool roofs. Achieve 25% beyond Title 24. | |

[38] City of Pleasanton. 2012. City of Pleasanton Climate Action Plan. Website: http://www.cityofpleasantonca.gov/civicax/filebank/blobdload.aspx?BlobID=24757. Accessed March 30, 2018.

[39] Bay Area Air Quality Management District (BAQMD). 2017. California Environmental Quality Act Air Quality Guidelines. May. Website: http://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed March 29, 2018.

## Table 3.6-4 (cont.): Project Consistency with Applicable GHG Reduction Goals and Supporting Actions from the City of Pleasanton CAP

| Applicable Goals and Supporting Actions | Project Consistency |
|---|---|
| **Supporting Action EC1-3:** Modify municipal code to reduce heat island effects in the City by requiring light-colored paving material for roads and parking areas, as well as parking lot shade trees. | Renewable Portfolio Standard, which requires utilities to increase its mix of renewable energy sources to 33 percent by 2020. Additionally, the project would comply with the California Green Building Standards Code, which includes requirements to increase recycling, reduce waste, reduce water use, increase bicycle use, and other measures that will reduce greenhouse gas emissions. The project would also preserve 80 acres as agricultural open space and would include landscaping, including shade trees, in developed areas. |
| **Land Use and Transportation** | |
| **Goal 2:** Improve Transit Systems and Ridership | **Consistent.** Implementation of the project would provide housing near similar, existing land uses and within the vicinity of open space, recreation, and commercial land uses. Transit service in the area is provided by Wheels, Pleasanton Paratransit, The County Connection, Bay Area Rapid Transit (BART), and Altamont Commuter Express (ACE). Continuous pedestrian connections are not provided to transit stops from the project site, and the closest transit stop is over 1.5 miles from the project site; therefore, it is expected that any future residents who would use transit would drive to transit stops or stations. Motor vehicle emissions associated with the project would be reduced through compliance with state regulations on fuel efficiency and fuel carbon content. The regulations include the Pavley fuel efficiency standards that require manufacturers to meet increasing stringent fuel mileage rates for vehicles sold in California and the Low Carbon Fuel Standard that requires reductions in the average carbon content of motor vehicle fuels. Considering this information, the project would not conflict with the City's goals and strategies aimed to increase non-motorized mobility, improve transportation demand management, increase motor vehicle efficiency, or other goals aimed to reduce GHG emissions from transportation. |
| **Goal 3:** Increase Non-motorized Mobility | |
| **Supporting Action NM 1-1:** Require appropriate bicycle-related improvements (i.e., work-place provision for showers, bicycle storage, bicycle lanes, etc.) with new development. | |
| **Supporting Action NM 1-18:** Preserve rights-of-way needed for local and regional roadway "complete streets" improvements and increased connectivity through dedication of land, as adjacent properties develop. | |
| **Supporting Action NM 1-19:** Modify municipal development codes to develop complete street standards to maximize transportation opportunities that serve all mobility modes. | |
| **Goal 4:** Improve Transportation Demand Management | |
| **Goal 5:** Increase Motor Vehicle Efficiency | |

## Table 3.6-4 (cont.): Project Consistency with Applicable GHG Reduction Goals and Supporting Actions from the City of Pleasanton CAP

| Applicable Goals and Supporting Actions | Project Consistency |
|---|---|
| **Solid Waste Minimization** | |
| **SW Goal:** Establish Pleasanton as a Zero Waste Community by 2025 | **Consistent.** The project will comply with the California Green Building Standards Code, which includes requirements to increase recycling, reduce waste, reduce water use, increase bicycle use, and other measures that will reduce greenhouse gas emissions. The project would also be subject to City requirements, which are designed to help the City achieve the target of establishing Pleasanton as a Zero Waste Community by 2025. Future residents would have access to City and regional programs, educational materials, and other resources aimed to reduce community waste. |
| **Supporting Action SW 2-2:** Develop community zero waste plan—75% diversion by 2015; 85% diversion by 2020; 90% by 2025; that includes strategies and implementation timeline for improving diversion and reducing waste generation. | |
| **Supporting Action SW 2-3:** Residential Curbside Recycling Program—In 2009, new residential curbside recycling program replaced the blue bag program with a separate collection cart for recyclable materials. Expand residential recycling program to include the collection and processing of more materials including single use plastics. | |
| **Supporting Action SW 2-5:** Expand residential yard and food waste collection program to multifamily residences, a service provided to single family residents since 2006. | |
| **Supporting Action SW 2-6:** Implement and enforce Construction and Demolition debris recycling ordinance. | |
| **Supporting Action SW 2-7:** Launch outreach campaign to increase participation in residential recycling and composting programs and to promote waste reduction. | |
| **Supporting Action SW 2-8:** Utilize resources available through StopWaste.org to promote backyard composting, grasscycling, and low maintenance landscaping. | |
| **Water and Wastewater** | |
| **Goal:** Reduce Water Use | **Consistent.** As described in the project description, the project would include landscaping around the home sites in the Spotorno Flat Area as well as on-site trails. A total of 232 trees would be planted, consisting predominantly of red maple (*Acer rubrum*), Marina strawberry (*Arbutus unedo*), white ash (*Fraxinus americana*), London plane tree (*Platanus acerifolia*), and coast live oak (*Quercus agrifolia*). These tree species would require low to medium amounts of water. Groundcover landscaping would consist of three species, parvifolium (*Myoporum parvifolium*), mauve clusters (*Scaevola albida*), sodden native fescues turf, and native hydroseed. These species all require a low amount of water. Over 30 shrub species are proposed for the home site landscaping as well, including fortnight lily (*Dietes* |
| **Supporting Action WA 1-4:** Implement a landscape ordinance requiring new commercial and residential projects to meet prescribed landscape water budgets and ensure that new construction uses the latest irrigation technology, and meet or exceed AB 1881 requirements | |
| **Supporting Action WA 1-7:** Restrict landscape watering; encourage xeriscaping and drought-resistant planting in lieu of lawns. | |

**Table 3.6-4 (cont.): Project Consistency with Applicable GHG Reduction Goals and Supporting Actions from the City of Pleasanton CAP**

| Applicable Goals and Supporting Actions | Project Consistency |
|---|---|
| | *bicolor*), butterfly bush (*Buddleja davdii*), and catmint (*Nepeta faassenii*), among others. All shrub species would require a minimal amount of watering. |
| **Community Engagement** | |
| **Goal:** Influence Personal Behavior | **Consistent.** Implementation of the project would not hinder City in developing or facilitating programs aimed to engage or educate City residents in matters relating to sustainable personal behaviors. Future residents could participate in community outreach programs promoted by the City. |
| **Supporting Action PE 1-3:** In conjunction with the www.PleasantonGreenScene.org website, develop a citywide outreach program that engages, educates, and exchanges information on implementing the measures in the Climate Action Plan and related General Plan policies. | |
| **Supporting Action PE 1-4:** Develop user-friendly fact sheets for ways that residents, landlords and/or businesses can reduce GHG emissions by improving energy and water efficiency, reducing waste, and improve home performance using green building techniques; organize information by cost efficiency and type of home or building (apartment, slab foundation, pier foundation, etc.). If available, include funding and implementation resources. Distribute at events and post on web site. | |
| Source of applicable City of Pleasanton GHG reduction goals and supporting actions: City of Pleasanton. 2012. City of Pleasanton Climate Action Plan. Website: http://www.cityofpleasantonca.gov/civicax/filebank/blobdload.aspx?BlobID=24757. Accessed March 30, 2018. | |

In summary, the project would not conflict with the City of Pleasanton CAP or regulations adopted by the State of California to reduce GHG emission and would comply with all mandatory local and regional measures applicable to the project. As shown in Impact GHG-1, the project would incrementally increase GHG emissions, but not to a level that would generate significant effects. Considering this information, the project would not conflict with any applicable plan, policy or regulation of an agency adopted to reduce the emissions of GHGs. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# 3.7 - Hazards and Hazardous Materials

## 3.7.1 - Introduction

This section describes the existing hazards and hazardous materials setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on the City of Pleasanton General Plan and EIR, Happy Valley Specific Plan, Happy Valley Specific Plan EIR, various State of California environmental databases, and the Phase I Environmental Site Assessment (Phase I ESA) report prepared by ENGEO Inc., included in this Draft SEIR as Appendix F.

## 3.7.2 - Environmental Setting

Hazardous materials as defined by the California Code of Regulations are substances with certain physical properties that could pose a substantial present or future hazard to human health or the environment when improperly handled, disposed, or otherwise managed. Hazardous materials are grouped into the following four categories, based on their properties:

- Toxic—causes human health effects.
- Ignitable—has the ability to burn.
- Corrosive—causes severe burns or damage to materials.
- Reactive—causes explosions or generates toxic gases.

A hazardous waste is any hazardous material that is discarded, abandoned, or slated to be recycled.

The criteria that define a material as hazardous also define a waste as hazardous. If handled, disposed, or otherwise handled improperly, hazardous materials and hazardous waste can result in public health hazards if released into the soil or groundwater or through airborne releases in vapors, fumes, or dust. Soil and groundwater having concentrations of hazardous constituents higher than specific regulatory levels must be handled and disposed of as hazardous waste when excavated or pumped from an aquifer. The California Code of Regulations, Title 22, Sections 66261.20-24 contains technical descriptions of toxic characteristics that could cause soil or groundwater to be classified as hazardous waste.

### Existing Conditions

The project site consists of undeveloped land currently used for livestock grazing. The State of California uses databases including GeoTracker and EnviroStor to map the location of hazardous waste sites including sites that have been remediated, sites currently undergoing remediation, and sites that require cleanup. The GeoTracker website showed one Leaking Underground Storage Tank (LUST) site located less than 1 mile west of the proposed project site, at 6177 Sunol Boulevard. This site is identified as the Kaiser Aluminum and Chem Corporation (Site #T0600191128), and as of 2009, the cleanup was completed.[1] A search on the EnviroStor website showed one site 2.1 miles west of the project site, identified as the Applied Biosystems site (Case #01280050), located at 6001

[1] State Water Resource Control Board GeoTracker. n.d. Website: https://geotracker.waterboards.ca.gov/profile_report.asp?global_id =T0600191128. Accessed March 13, 2017.

Sunol Boulevard. The site underwent contaminant remediation in 1996, and a closure letter was issued by the Department of Toxic Substances Control (DTSC) in 2003 for the completion of on-site cleanup. The latest available monitoring and sampling reports from 2008 through 2013 indicate that PCE concentrations have been substantially reduced below cleanup level goals in groundwater samples from monitoring wells.[2]

A Phase I ESA was prepared for the project site on January 9, 2015 by ENGEO Inc. (Appendix F). The Phase I assessment determined that no current or historic Recognizable Environmental Conditions[3] (RECs) exist on the project site. No physical evidence of soil or groundwater impairment associated with the project site was identified.

The nearest airport to the project site is Livermore Municipal Airport, roughly 7.3 miles to the northwest. The project site does not fall within the Sphere of Influence of the Livermore Municipal Airport or any other airport.[4]

According to the California Department of Forestry and Fire Protection (CAL FIRE) Fire Hazard Severity Zone maps, the project site is within a Moderate to High Fire Hazard State Responsibility Area.[5]

## 3.7.3 - Regulatory Framework

### Federal

#### *United States Environmental Protection Agency*

The United States Environmental Protection Agency (EPA) leads the nation's environmental science, research, education, and assessment efforts. The EPA's mission is to protect human health and to safeguard the natural environment, related to air, water, and land. The EPA works closely with other federal agencies, state and local governments, and Indian tribes to develop and enforce regulations under existing environmental laws. The EPA is primarily responsible for researching and setting national standards for a variety of environmental programs and delegates to states and tribes responsibility for issuing permits, and monitoring and enforcing compliance. When national standards are not met, the EPA can issue sanctions and take other steps to assist the states and tribes in reaching the desired levels of environmental quality. The EPA also works with industries and all levels of government in a wide variety of voluntary pollution prevention programs and energy conservation efforts.

EPA Region 9 has jurisdiction over Pleasanton and the southwestern United States (Arizona, California, Nevada, and Hawaii). EPA programs related to hazardous materials include the following:

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[2] Department of Toxic Substances Control (DTSC), accessed March 13, 2017. Website: http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=01280050.

[3] An REC is defined as the presence or likely presence of any hazardous substances or petroleum products, in, on or at a property (1) due to release to the environment, (2) under conditions indicative of a release to the environment, or (3) under conditions that pose a material threat of a future release to the environment.

[4] Alameda County Airport Land Use Commission and Airport Land Use Planning Airport Land Use Policy Plan. Website: http://www.acgov.org/cda/planning/generalplans/airportlandplans.htm. Accessed April 20, 2017.

[5] CAL FIRE. 2007. Alameda County Fire Hazard Maps. Website: http://www.fire.ca.gov/fire_prevention/fhsz_maps_alameda. Accessed April 19, 2017.

- Community Right-to Know Information
- Pesticide Management
- Toxic Release Inventory
- Brownfields (CalSites Database)
- Cleanup Technologies
- Compliance Assistance
- Emergency Response
- Hazardous Waste
- Oil Spills

### *Resource Conservation and Recovery Act*

The 1976 Federal Resource Conservation and Recovery Act (RCRA) and the 1984 RCRA Amendments regulate the treatment, storage, and disposal of hazardous and non-hazardous wastes. The legislation mandated that hazardous wastes be tracked from the point of generation to their ultimate fate in the environment. This includes detailed tracking of hazardous materials during transport and permitting of hazardous material handling facilities.

### *Comprehensive Environmental Response, Compensation, and Liability Act*

Discovery of environmental health damage from disposal sites prompted the U.S. Congress to pass the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or Superfund). The purpose of CERCLA is to identify and clean up chemically contaminated sites that pose a significant environmental health threat. The Hazard Ranking System is used to determine whether a site should be placed on the National Priorities List for cleanup activities.

### *Superfund Amendments and Reauthorization Act*

The Superfund Amendments and Reauthorization Act relates primarily to emergency management of accidental releases. It requires formation of state and local emergency planning committees, which are responsible for collecting material handling and transportation data for use as a basis for planning. Chemical inventory data is made available to the community at large under the "right-to-know" provision of the law. In addition, the Superfund Amendments and Reauthorization Act requires annual reporting of continuous emissions and accidental releases of specified compounds. These annual submissions are compiled into a nationwide Toxics Release Inventory.

### *Hazardous Materials Transportation Act*

The Hazardous Materials Transportation Act is the statutory basis for the extensive body of regulations aimed at ensuring the safe transport of hazardous materials on water, rail, highways, through air, or in pipelines. It includes provisions for material classification, packaging, marking, labeling, placecarding, and shipping documentation.

### *U.S. Department of Transportation*

Under the Hazardous Materials Transportation Act of 1976, the U.S. Department of Transportation (USDOT) Office of Hazardous Materials Safety regulates the transportation of hazardous materials and enforces guidelines created to protect human health and the environment and reduce potential impacts to less than significant through the creation of hazardous material packaging and transportation requirements. The USDOT provides hazardous materials safety training programs and supervises hazardous materials activities. The USDOT also develops and recommends regulations governing the multimodal transportation of hazardous materials.

## State

### *California Hazardous Waste Control Law*

The Hazardous Waste Control Law is the primary hazardous waste statute in the State of California. The Hazardous Waste Control Law implements RCRA as a "cradle-to-grave" waste management system in the State of California. The law specifies that generators have the primary duty to determine whether their waste is hazardous and to ensure their proper management. The Hazardous Waste Control Law also establishes criteria for the reuse and recycling of hazardous waste used or reused as raw materials. The law exceeds federal requirements by mandating source reduction planning, and a much broader requirement for permitting facilities that treat hazardous waste. It also regulates a number of types of waste and waste management activities that are not covered by federal law with RCRA.

### *California Public Resources Code*

The California Public Resources Code includes fire safety regulations that restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors[6] on construction equipment that use an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire suppression equipment that must be provided on-site for various types of work in fire-prone areas.

These regulations include the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (Public Resources Code § 4442);
- Appropriate fire suppression equipment must be maintained during the highest fire danger period—from April 1 to December 1 (Public Resources Code §4428);
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would maintain the appropriate fire suppression equipment (Public Resources Code §4427); and
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (Public Resources Code §4431).

## Local

The Alameda County Hazardous Waste Management Plan governs hazardous waste management programs in Pleasanton. The Alameda County Disaster Plan is a coordinated, countywide approach for managing debris generated in Alameda County in the event of earthquakes, fires, floods, accidents, or civil unrest. As discussed above, the Alameda County Airport Land Use Commission (ALUC) has established airport safety zones and other safety areas.

[6] A spark arrestor is a device that prohibits exhaust gases from an internal combustion engine from passing through the impeller blades where they could cause a spark. A carbon trap is commonly used to retain carbon particles from the exhaust.

### *City of Pleasanton Comprehensive Emergency Management Plan*

The Comprehensive Emergency Management Plan addresses the City of Pleasanton's responsibilities in emergencies associated with natural disaster, human-caused emergencies, and technological incidents. It conforms to the State-mandated Standardized Emergency Management System and the National Incident Management System and provides a framework for coordination of response and recovery efforts within the City in coordination and with local, state, and federal agencies. The Plan establishes an emergency organization to direct and control operations during a period of emergency by assigning responsibilities to specific personnel.

### *City of Pleasanton Municipal Code*

The Pleasanton Municipal Code contains numerous regulations with respect to hazards and hazardous materials, summarized below:

Chapter 9.16 deals with the implementation of SB 1082 Certified Unified Program Agency programs. Such programs include hazardous materials release response plans and inventories; the California accidental release prevention program; underground and aboveground storage tanks storage tanks oversight; and hazardous waste generators and on-site treatment oversight. Pursuant to this Ordinance, the Livermore-Pleasanton Fire Department assumes authority, responsibility, and enforcement authority as the Certified Unified Program Agency for the City of Pleasanton.

The Pleasanton Municipal Code contains three sections that bear directly on fire safety. The Building Code, Chapter 20.08, provides minimum standards for design, construction, materials, occupancy, location, and maintenance of all buildings within the City. The Fire Code, Chapter 20.24, regulates how a building is used, how machines and equipment are maintained, how hazardous materials are handled and stored, and how access to and from a site is provided. The Subdivision Ordinance, Chapter 19.36, establishes standards for roadway dimensions, subdivision layout, and public improvements needed to protect public safety. In addition, all new developments are reviewed by City departments for their potential effects on public safety, and conditions are attached to minimize those effects and inspections are conducted to ensure proper installation. Developments located outside the 5-minute response time areas are required to provide additional fire mitigation measures, which include, at a minimum, automatic fire sprinkler systems.

Chapter 9.21 covers construction and demolition debris. Any project that is regulated by the City of Pleasanton must submit a waste management plan (WMP) prior to construction, demolition, or any similar construction permit. The WMP requires the applicant to disclose estimated quantities of materials that will be salvaged, recycled, or disposed; the hauling method; and facility being utilized for construction or demolition materials.

## 3.7.4 - Methodology

The following analysis is based, in part, on information provided by the Happy Valley Specific Plan, Pleasanton General Plan, and relevant State of California websites. The information obtained from these sources and other relevant materials was reviewed and evaluated to establish the potential presence of hazards and hazardous materials on the project site.

## 3.7.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hazards and hazardous materials impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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

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

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

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?

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 the project area?

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?

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

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to hazards and hazardous materials and found that the project would have a potentially significant impact to hazards and hazardous materials without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR that are applicable to the proposed project. As shown in Appendix J, Mitigation Measures I2 through I5, I8, and I9 are not applicable to the project. Mitigation Measures I1, I6, I7, I10, and I11 would apply. These mitigation measures, applied to the HVSP in relation to hazards, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the hazards impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation and envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to hazards and hazardous materials. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.7.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the proposed project and provides mitigation measures where appropriate.

### Routine Transport, Use or Disposal of Hazardous Materials

| | |
|---|---|
| **Impact HAZ-1:** | **The project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.** |

#### *Impact Analysis*

*Short-term Construction Impacts*

During the construction of the residential development and related infrastructure, small quantities of hazardous materials such as such as gasoline, diesel fuel, lubricants for machines, and other-petroleum-based products would be used on-site. Removal and disposal of hazardous materials from the project site would be conducted by an appropriately licensed contractor. Any handling, transporting, use, or disposal would comply with applicable laws, policies, and programs set forth by various federal, state, and local agencies and regulations, including the EPA, RCRA, and City of Pleasanton Chapter 9.21 regarding construction and demolition debris. Required compliance with applicable hazardous material laws and regulations would ensure that construction-related hazardous material use would not result in significant impacts.

*Long-term Operational Impacts*

During the operational phase of the project, hazardous materials may be utilized on the project site. Because of the nature of the project, hazardous materials used on-site may vary, but would likely be limited to fertilizers, herbicides, pesticides, solvents, cleaning agents, and similar materials used for daily residential operations and home and yard maintenance activities. These types of materials are common for residential developments such as the project and are subsequently regulated by the EPA to minimize harm to people and the environment. Therefore, long-term operational impacts associated with hazardous materials would be less than significant.

#### *Level of Significance Before Mitigation*

Less than significant impact.

#### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Accidental Release of Materials

**Impact HAZ-2: The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment.**

### *Impact Analysis*

The project site is primarily undeveloped and is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 31 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acres) contains hilly terrain with steep slopes. As discussed under Impact HAZ-1, construction-related activity associated with the proposed project would be required to adhere to all applicable regulations. Removal and disposal of hazardous materials from the project site would be conducted by an appropriately licensed contractor. Any handling, transporting, use, or disposal would comply with applicable laws, policies, and programs set forth by various federal, state, and local agencies and regulations, including the EPA, RCRA, and City of Pleasanton Chapter 9.21 regarding construction and demolition debris.

Hazardous materials used on-site during operations may vary, but would likely be limited to fertilizers, herbicides, pesticides, solvents, cleaning agents, and similar materials used for daily residential operations and maintenance activities. These types of materials are common for residential developments such as the project and represent a low risk to people and the environment when used as intended. Therefore, development of the project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the likely release of hazardous materials into the environment. As such, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Hazardous Materials Site Listing

**Impact HAZ-3: The project would not 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.**

### *Impact Analysis*

The project site is not listed on any hazardous materials databases compiled pursuant to Government Code Section 65962.5. The State of California databases, including GeoTracker and EnviroStor, did not identify any locations of hazardous waste sites on the project site. The GeoTracker database showed one Leaking Underground Storage Tank (LUST) site located less than 1 mile west of the proposed project site, at 6177 Sunol Boulevard. However, this site (identified as Kaiser Aluminum) was listed as closed as of 2009.[7] A search on the EnviroStor website showed one site 2.1 miles west of the project site, identified as Applied Biosystems, located at 6001 Sunol Boulevard. The site underwent contaminant remediation in 1996 and achieved regulatory closure by the DTSC in 2003. The latest available monitoring and sampling reports from 2008 through 2013 indicate that perchloroethylene (PCE) concentrations have been substantially reduced below cleanup level goals in groundwater samples from monitoring wells.[8] Furthermore, a Phase I ESA prepared for the project site did not identify any RECs (see Appendix F). Therefore, development and operation of the project would not expose persons to residual hazardous materials from past uses of the project site and thus would thus not create a significant hazard to the public or the environment. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Emergency Evacuation Plans

**Impact HAZ-4: The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.**

### *Impact Analysis*

The City of Pleasanton has in place several emergency plans regarding public safety and emergency evacuations, including the General Plan Safety Element, Emergency Management Plan (EMP), and Local Hazard Mitigation Plan. The EMP provides safety measures for the community in the event of a natural disaster (earthquake, flood, or fire), human-caused emergencies, or hazardous materials

[7] State Water Resource Control Board GeoTracker. n.d. Website: https://geotracker.waterboards.ca.gov /profile_report.asp?global_id=T0600191128. Accessed March 13, 2017.

[8] Department of Toxic Substances Control (DTSC). n.d. Website: http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_ id=01280050. Accessed March 13, 2017.

spill. The EMP provides a framework for coordination of response and recovery efforts within the City in coordination with local, state and federal agencies. The City General Plan Safety Element also provides information, policies, and programs directed toward reducing the potential for human injury and loss of life, and to minimize property damage and economic and social disruption due to natural and human-made hazards.

As indicated in Section 3.11 Public Services, with mitigation the project would be adequately served by police and fire services. The proposed residential units would be constructed in compliance with the California Fire Code with regard to access and building materials such as tile or other fire-resistant roofing. The proposed project would provide a primary access road connecting Alisal Street to Westbridge Lane. A cul-de-sac has been created along Westbridge Lane that would be closed to through traffic, but would have an emergency access gate to allow alternative emergency vehicle access to the project site and the golf course neighborhood from Happy Valley Road. All driveways and internal roadways would be designed in accordance with the City's Standards and Specifications guidebook to accommodate large emergency vehicles such as fire engines.

Alameda County Emergency Operations Plan, Pleasanton Emergency Management Plan, Local Hazard Mitigation Plan, and the Safety Element of the 2025 General Plan do not list emergency evacuation routes. Interstate 680 would be the most likely evacuation route to be used in the case of an emergency. The Safety Element of the General Plan and the Emergency Operations Plan has emergency preparedness policies and plans in case an emergency takes place. The project is located within a flat grassy area and would not interfere with evacuation along these routes or otherwise conflict with an adopted emergency response plan or emergency evacuation plan. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Wildland Fires

| | |
|---|---|
| **Impact HAZ-5:** | **The project would not 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.** |

### *Impact Analysis*

As noted in the Pleasanton General Plan Public Safety Element, over 7,000 acres of the Pleasanton planning area are identified as special fire protection areas. Grassland fires in California are easily ignited, particularly in dry seasons. Wildfire is a serious hazard in undeveloped areas, particularly near areas of natural vegetation and steep slopes, since fires tend to burn more rapidly on steeper

terrain. As indicated by Figure 5-6 of Section 5, Public Safety of the City's General Plan, the project site is located in Happy Valley, which contracts with the City of Pleasanton for Fire Protection. According to the CAL FIRE Fire Hazard Severity Zone maps, the project site is within a Moderate to High Fire Hazard State Responsibility Area.

As indicated in Section 3.11, Public Services, the project would be adequately served by the Pleasanton-Livermore Fire Protection District's Fire Station 4, which is located northwest of the project site. As discussed previously, the proposed residences would incorporate tile or other fire-resistant roofing to minimize the spread of fire. In addition, proposed residences would be required to comply with the California Fire Code with regard to access and building materials. Adherence to the Public Resource Code Section 4291 (providing defensible space around buildings and restriction of fire-prone plant materials and flammable mulches) would reduce the risk of damage from fire to the maximum extent practicable. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

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# 3.8 - Hydrology and Water Quality

## 3.8.1 - Introduction

This section describes the existing hydrology and water quality setting of the project area and its surroundings. Descriptions and analysis in this section are based on the City of Pleasanton General Plan 2005-2025, 2015 City of Pleasanton Urban Water Management Plan, the Happy Valley Specific Plan (HVSP), the Happy Valley Specific Plan Final EIR (FEIR), and information provided by the California Department of Water Resources.

## 3.8.2 - Environmental Setting

### Climate

The regional climate is considered a Mediterranean climate with wet winters and relatively dry summers. Normal mean annual precipitation is about 14.82 inches per year with about 88 percent of the annual precipitation occurring from November through April. Mean annual precipitation from 2000 through 2006 was about 14.49 inches per year with about 95 percent occurring from November through April. Mean annual normal temperature is about 59.8°F and mean monthly temperature ranges from 47°F in December to 72°F in July. Mean annual temperature from 2000 through 2006 was 61.2°F and mean monthly temperature ranges from 48.4°F in January to 74.3°F in July.[1]

Table 3.8-1 summarizes local meteorology, as measured at Livermore Municipal Airport and reported by the Western Regional Climate Center.

**Table 3.8-1: Meteorological Summary**

| Month | Temperature (°F) | | Precipitation (inches) |
|---|---|---|---|
| | Average Minimum | Average Maximum | |
| January | 36.7 | 56.7 | 2.99 |
| February | 39.4 | 61.2 | 2.48 |
| March | 41.3 | 65.2 | 2.15 |
| April | 43.6 | 70.4 | 0.99 |
| May | 47.6 | 76.3 | 0.44 |
| June | 51.6 | 83.1 | 0.11 |
| July | 54.2 | 89.0 | 0.02 |
| August | 54.0 | 88.2 | 0.04 |
| September | 52.5 | 85.9 | 0.22 |
| October | 47.7 | 77.7 | 0.67 |
| November | 41.1 | 66.4 | 1.55 |
| December | 37.0 | 57.5 | 2.58 |

[1] City of Pleasanton 2005 General Plan 2025 DEIR, Hydrology Overview, page 3.6-1, September 2008.

## Table 3.8-1 (cont.): Meteorological Summary

| Month | Temperature (°F) | | Precipitation (inches) |
|---|---|---|---|
| | Average Minimum | Average Maximum | |
| Annual Average | 45.6 | 73.1 | 14.24 |

Notes:
Measurements taken at Livermore Municipal Airport, the nearest weather station to the Plan Area.
Period of Record: January 1, 1903 through October 31, 2011. Source: Western Regional Climate Center, 2012.

## Watershed

The City of Pleasanton lies within the Alameda Creek watershed, a drainage basin encompassing about 675 square miles between Mount Hamilton and Mount Diablo. Each stream, tributary, and reservoir within this area has its own smaller watershed that ultimately feeds into Alameda Creek. Alameda Creek flows northwest from its origin on Mount Hamilton until it meets the Arroyo de la Laguna near Sunol and then runs west through Niles Canyon to San Francisco Bay. The Arroyo de la Laguna collects the surface water runoff from the Tri-Valley and carries it south to Alameda Creek.[2]

### *Regional Surface Water*

**Arroyo las Positas**. The Arroyo las Positas is a major drainage feature of the Livermore Valley and drains approximately 51,000 acres. Summer flows are a combination of irrigation, urban flows, and agricultural runoff, all of which keep the Arroyo las Positas as a perennial creek. The Arroyo las Positas begins in the Altamont Hills east of Livermore and flows westward to its confluence with the Arroyo Mocho at the northeastern edge of the EPSP Area.

**Tassajara Creek.** Tassajara Creek flows from north to southwest, through the City of Dublin, crossing under Interstate 580 (I-580) into the City of Pleasanton at Old Santa Rita Road. After continuing under I-580, the creek flows for approximately one mile south before reaching its confluence with the Arroyo Mocho. South of I-580 Tassajara Creek flows are maintained by shallow groundwater aquifer seepage into the stream channel. The stream banks are incised (i.e., cut down) 15 to 20 feet with an active channel width of about 15 feet.

**Arroyo Mocho**. The Arroyo Mocho flows in an east to west and northwest direction through the Chain of Lakes area, then turns in a southwesterly direction west of El Charro Road to its confluence with the Alamo Canal near I-680. The channel is trapezoidal in shape, with levees along its upper length within the watershed. The creek bed between Alamo Canal and Santa Rita Road has been actively incised to an average bottom width of 20 feet with side slopes of 3:1 to 4:1. The Arroyo Mocho drains approximately 36,000 acres (56.2 square miles) of mixed agriculture, urban, and undeveloped lands starting in Santa Clara County, where it flows generally to the northwest. Because of the regional Mediterranean climate, flow within the Arroyo Mocho is variable; summer flows are low and often depend upon releases from Zone 7 storage facilities for groundwater recharge to the Chain of Lakes system. This arroyo may run dry during the summer.

[2] *Id*. at page 3.6-2.

**Alamo Canal.** Alamo Canal is a trapezoidal flood control channel that carries flows from South San Ramon Creek and Alamo Creek (north of Pleasanton in the cities of San Ramon and Dublin) into the Arroyo de la Laguna. This canal runs for approximately 3 miles from the I-680/I-580 interchange, parallel to I-680.

**Arroyo del Valle**. The Arroyo del Valle is an unchannelized stream that originates at the Del Valle Reservoir and flows west through unincorporated Alameda County, Shadow Cliffs Regional Recreation Area, and continues to meander through the City of Pleasanton to its confluence with the Arroyo de la Laguna and Alamo Canal. A distinctive riparian corridor is present on both sides of the stream channel.

**Chain of Lakes**. The Chain of Lakes is a series of former gravel pits that are currently being improved for stormwater retention/flood control and groundwater recharge. Water from the Arroyo Mocho is released periodically into the Chain of Lakes area. The Arroyo Mocho flows through the Tri-Valley and near the Chain of Lakes, but is separated from it by levees. Surface water does not flow out of the Chain of Lakes area; thus, the area is not considered part of the Arroyo Mocho Watershed.[3]

### *Water Quality*

Both Zone 7 and the City of Pleasanton operate extensive water quality monitoring programs that the agencies have continually updated and refined over the last decade. Neither agency has detected any significant levels of volatile organic compounds or contaminants in the water supply. In addition, Pleasanton's water quality complies with all federal and State drinking water-quality standards. The San Francisco Bay Regional Water Quality Control Board has characterized the Arroyo de la Laguna, Arroyo las Positas, Arroyo del Valle, Arroyo Mocho, and Alameda Creek as impaired by diazinon. Diazinon is a pesticide used on a variety of agricultural crops and formerly used on residential gardens and lawns. As of December 31, 2004, the United States Environmental Protection Agency (EPA) no longer permits its sale for nonagricultural uses. Because of the ban, the diazinon levels in the creeks entering the Bay have diminished.[4]

The Lower San Francisco Bay is listed as impaired by chlordane, DDT, dieldrin, and mercury from nonpoint sources; by dioxin compounds, furan compounds, and mercury from atmospheric deposition; by exotic species from ballast water; and by PCBs and dioxin-like PCBs from unknown nonpoint sources. Industrial and municipal point sources, resource extraction, and natural sources contribute to mercury degradation of the Lower San Francisco Bay. The Zone 7 Surface Water Monitoring Program measured water quality within the Arroyo Mocho in June 2005. Table 3.8-1 of the General Plan EIR lists concentrations of various constituents at monitoring sites in the Plan Area from testing dates in 2005, as well as the applicable water quality criteria/regulations for surface water resources. Although water quality criteria are long-term thresholds rather than single measurement criteria, this information serves as an indicator of possible impairments. Constituents exceeding regulatory thresholds on the sampling dates included total dissolved solids, chloride, and nitrates.[5]

The Dublin-San Ramon Services District (DSRSD) treats and monitors the City's sewage effluent by contract. The sewage treatment plant produces secondary effluent, which is pumped to the San

[3] *Id*. at page 3.6-2.
[4] City of Pleasanton 2005 General Plan 2025, Chapter 8 Water Element, "Water Quality," page 8-8, July 2009.
[5] City of Pleasanton 2005 General Plan 2025 DEIR, Surface Water Drainage, page 3.6-5, September 2008.

Francisco Bay; tertiary effluent, which is used primarily for landscape watering in commercial areas in Dublin; and sludge, which is decomposed and then buried nearby in the drying beds north of Stoneridge Drive. The District monitors secondary effluent on a daily basis and monitors the sewage transport system for pH levels (a measure of acidity or alkalinity) and hydrogen sulfide. At its sewage ponds site, the District operates numerous test wells that have shown no toxic material intrusion on the soil content.[6]

### *Local Drainage*

The City's storm drainage system is composed of curb inlets, pipes, and natural swales that carry runoff to flood control channels known as arroyos. Existing surface water drainage within the approximately 31-acre area of the project site where development would occur consists of generally flat open space drainages and small existing wetlands that drain naturally into Happy Valley Creek and eventually Arroyo de la Laguna. Existing surface water drainage within the rest of the project site that would remain as open space is characterized by severe slopes that exceed 25 percent. According to the HVSP, limited flooding has been known to occur during winter storms along Alisal Street and Happy Valley Road.[7]

## Groundwater

### *Groundwater Basin*

The Plan Area is located above the Livermore Valley Groundwater Basin (ID 2-10). The general groundwater gradient is to the west, then south towards the Arroyo de la Laguna. Elevations within the basin range from about 600 feet above mean sea level in the east, near the Altamont Hills, to about 280 feet above mean sea level in the southwest, where the Arroyo de la Laguna flows into the Sunol Groundwater Basin area. The basin surface area is approximately 69,600 acres (108.8 square miles) and extends from the Altamont Hills and Greenville fault to the east to the Pleasanton and Main Ridges as well as the Calaveras fault on the west, and from the Orinda Upland south to the Livermore Upland fault. The two major faults, the San Andreas and Hayward Faults prevent lateral groundwater movement. The basin storage capacity is estimated at approximately 500,000 acre-feet and the amount in storage during 1999 was estimated at approximately 219,000 acre-feet.[8]

This groundwater basin is divided into two major basins, based on geophysical properties: the Main Basin and Fringe Basin. These sources of groundwater co-mingle in the Bernal and Amador sub-basin, and generally flow towards municipal or gravel mining company groundwater pumping wells. The southeastern region of the Livermore Valley is the most important groundwater recharge area and consists of mainly sand and gravel that was deposited by the ancestral Tulare Lake and current Arroyo del Valle and Arroyo Mocho.[9]

Although all creeks feeding the Arroyo de la Laguna are naturally seasonal, Zone 7 of the Alameda County Flood Control and Water Conservation District releases both stored water from the Del Valle

[6] City of Pleasanton. 2009. 2005 General Plan 2025, Chapter 8 Water Element, page 8-8, July.
[7] City of Pleasanton. 1998. Happy Valley Specific Plan, page 76, June.
[8] City of Pleasanton 2005 General Plan 2025 DEIR, Groundwater, page 3.6-6, September 2008.
[9] *Id.* at page 3.6-7.

Reservoir and imported water from the South Bay Aqueduct into these creeks. These controlled water releases recharge the local groundwater basin underlying the Plan Area.[10]

The groundwater basin includes several aquifers consisting of water-bearing gravel layers separated by impervious clay layers. Directly under flat portions of the City of Pleasanton planning area sits the greatest amount of usable groundwater in the main water basin.[11]

### *Groundwater Depth*

The depth to groundwater within the City of Pleasanton planning area ranges between approximately 22 and 67 feet below ground surface, depending upon the groundwater subbasin.[12]

### *Groundwater Quality*

The Main Basin is characterized by relatively good quality groundwater that meets all state and federal drinking water standards with only minimal treatment (chlorination to preserve quality in the distribution system). In general, the quality of water in the central portion of the Main Basin varies from fair to excellent. A number of wells are located within this area because of this potable quality water. The total dissolved solids content in the central portion of the Main Basin averages about 400 to 700 milligrams per liter. The Main Basin supports large-capacity municipal production wells and is used to store and distribute high-quality imported water through Zone 7's recharge program. The groundwater in the Fringe Sub-basins tends to be saltier than the Main Basin. Zone 7 has developed a salt management plan to identify and evaluate all significant salt loading to, and removal from, the groundwater basin. The Zone 7 monitoring indicates that groundwater used for potable water supplies meets regulatory goals for drinking water including arsenic, total chromium VI, chloride, total dissolved solids, hardness, chloramines, free ammonia, total trihalomethanes, and five haloacetic acids.

Zone 7 has identified recharge of local streamflow and imported water, subsurface inflow, and irrigation returns as major contributors to increasing total dissolved solids (TDS) concentration. TDS in the local surface water varies significantly throughout the watershed from approximately 350 milligrams per liter (mg/l) TDS to more than 1,000 mg/l. The highest-quality surface water recharging the basin occurs through the Arroyo Mocho and Arroyo del Valle where the TDS is generally less than 500 mg/l. The poorest quality surface water recharging the basin has a TDS of approximately 1,000 mg/l and occurs in the Arroyo las Positas. Localized elevated groundwater nitrate levels are associated with livestock operations and septic tank usage in the central and eastern portions of the Livermore Valley.[13]

## Water Supply

The City purchases approximately 80 percent of its water from Zone 7 Water Agency, and obtains the remaining approximately 20 percent from three groundwater wells that are owned and operated by the City. In addition, Zone 7 retails non-potable water supplies for irrigated agricultural uses, retails treated water to several direct customers, provides and maintains flood control facilities, and

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[10] *Id*. at page 3.6-8.
[11] City of Pleasanton 2005 General Plan 2025, Chapter 8 Water Element, page 8-5, July 2009.
[12] City of Pleasanton 2005 General Plan 2025 DEIR, Groundwater, page 3.6-9, September 2008.
[13] *Id*.

manages groundwater and surface water supplies in its service area. The City is limited in developing other water supply sources under its current agreement with Zone 7.

Zone 7's water supply reliability has decreased in recent years, due to changes in operation of state and federal water projects that limit pumping in the San Joaquin Delta. The change in operations has lowered the State's ability to meet its contractual demands, and by extension, has limited Zone 7's ability to serve increased water demands. The City itself does not have any plans for new potable water supply projects. Zone 7 has identified potential programs and projects to increase Zone 7's water supply, including California WaterFix, Potable Reuse options, and desalination.

Conservation program improvements are being funded and implemented through water supply assessments. In addition, the Dublin-San Ramon Services District Recycled Water Treatment Facility produces approximately 4.0 million gallons per day (mgd) of recycled water, and there are plans to modify the facility to provide an additional 2.0 mgd of recycled water. In the interim, the City has an agreement to obtain up to 333,000 gallons of recycled water per day from the City of Livermore. Recycled water deliveries from Livermore would cease once the improvements to the Dublin-San Ramon Services District Recycled Water Treatment Facility are completed.

## 3.8.3 - Regulatory Framework

### Federal

#### *Clean Water Act*

Section 303 of the 1972 Federal Clean Water Act (CWA) requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards; refer to a description of State Porter-Cologne Water Quality Control Act, which follows below. Standards are based on the designated beneficial use(s) of the water body. Where multiple uses exist, water quality standards must protect the most sensitive use.

Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater program. Pursuant to Section 402 of the CWA and the Porter-Cologne Water Quality Control Act, municipal stormwater discharges in the City of Pleasanton are regulated under the San Francisco Bay Regional Water Quality Control Board's (SFBRWQCB) Municipal Regional Stormwater Permit (MRP), Order No. R2-2015-0049, NPDES Permit No. CAS612008, adopted November 19, 2015. The Municipal Regional Permit is overseen by the SFBRWQCB. The City of Pleasanton is a member agency of the Alameda Countywide Clean Water Program, which assists municipalities and other agencies in Alameda County with implementation of the Municipal Regional Permit. Provision C.3 addresses post-construction stormwater management requirements for new development and redevelopment projects that add and/or replace 10,000 square feet or more of impervious area. Provision C.3 requires the incorporation of site design, source control, and stormwater treatment measures into development projects in order to minimize the discharge of pollutants in stormwater runoff and non-stormwater discharges, and to prevent increases in runoff flows. Low Impact Development methods are to be the primary mechanism for implementing such controls.

Municipal Regional Permit Provision C.3.g pertains to hydromodification management. This Municipal Regional Permit provision requires that stormwater discharges not cause an increase in the erosion potential of the receiving stream over the existing condition. Increases in runoff flow and volume must be managed so that the post-project runoff does not exceed estimated pre-project rates and durations, where such increased flow and/or volume is likely to cause increased potential for erosion of creek beds and banks, silt pollutant generation, or other adverse impacts on beneficial uses due to increased erosive force.

The law requires that a permit (Section 404) be obtained from the United States Army Corps of Engineers (USACE) for any dredge or fill materials into wetlands or waters of the United States.

### *National Pollution Discharge Elimination System (NPDES)*

Point source discharges to surface waters are generally controlled through waste discharge requirements issued under the NPDES permits. Although the NPDES program was established by the CWA, the EPA has delegated management of California's NPDES permit program to SWRCB and the nine regional (RWQCB) offices. Issued in five-year terms, an NPDES permit usually contains components such as discharge prohibitions, effluent limitations, and necessary specifications and provisions to ensure proper treatment, storage, and disposal of the waste. The permit often contains a monitoring program that establishes monitoring stations at effluent outfall and receiving waters (California Regional Water Quality Control Board, San Francisco Bay Region, 2007). The 1987 amendments to the Clean Water Act (Section 402[p]) provided for the U.S. EPA regulation of non-point pollution sources from municipal, construction, and industrial activities.

*Municipal*

In 1990, the RWQCB adopted the Phase 1 NPDES permits for urban runoff discharges from municipalities of over 100,000 people. In 2003, the RWQCB issued Phase 2 NPDES permits to cities of 50,000 to 100,000. The City of Pleasanton is part of the Alameda Countywide Clean Water Program (Program) that has been issued a Phase I NPDES permit under the Clean Water Act for discharge of stormwater runoff. The Program is an association of cities and towns in the Alameda County that share a common permit to discharge stormwater to San Francisco Bay.

*Construction*

In addition, projects disturbing more than 1 acre of land during construction are required to comply with the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order No. 2009-0009-DWQ, NPDES No. CAS000002 (Construction General Permit). Construction General Permit activities are regulated at a local level by the RWQCB.

To obtain coverage under the Construction General Permit, a project applicant must provide a Notice of Intent, a Stormwater Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation. The permit also covers linear underground and overhead projects such as pipeline installations.

The Construction General Permit uses a risk-based permitting approach and mandates certain requirements based on the project risk level (Level 1, Level 2, or Level 3). The project risk level is based

on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on project location and timing (such as wet season versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water. The determination of the project risk level would be made by project applicants when the Notice of Intent is filed (and more details of the timing of the construction activity are known).

The performance standard in the Construction General Permit is that dischargers minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and best management practices (BMPs). A SWPPP must be prepared by a qualified SWPPP developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is (1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges, and (2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. Operation of BMPs must be overseen by a qualified SWPPP practitioner who meets the requirements outlined in the permit.

## State

### *Porter-Cologne Water Quality Control Act*

The Porter-Cologne Water Quality Control Act of 1969 authorized the SWRCB to provide comprehensive protection for California's waters through water allocation and water quality protection. The SWRCB implements the requirement of the Clean Water Act Section 303 that water quality standards must be set for certain waters by adopting water quality control plans under the Porter-Cologne Act. The Porter-Cologne Act established the responsibilities and authority of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements (WDRs). Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the EPA to issue NPDES permits.

Section 303(d) of the CWA requires that the SWRCB identify surface water bodies within California that do not meet established water quality standards. Once identified, the affected water body is included in the SWRCB's "303(d) Listing of Impaired Water Bodies," and a comprehensive program must then be developed to limit the amount of pollutant discharges into that water body. This program includes the establishment of "total maximum daily loads" (TMDL) for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the EPA in 2010.

### *California Water Code Section 10910 (b)*

According to California Water Code Section 10910(b), any city or county that determines a new development project is subject to the California Environmental Quality Act (CEQA) must prepare a water supply assessment (WSA) if the development qualifies as a "project" pursuant to Water Code Section 10912. A WSA is required for projects with more than 500 residential units. If there is a "public water system" for the project, the water supplier shall prepare the water supply assessment. A public water system is defined as a system that has 3,000 or more service connections and provides piped water to the public for public consumption. Under this definition, the City is a "public

water system" as it provides piped water to the public for consumption and has more than 21,000 service connections.

### *California Dam Safety Act*

The State of California Dam Safety Act requires submittal of inundation maps to the California Office of Emergency Services (OES) for any dams whose total failure would result in loss of life or personal injury. This law also requires local jurisdictions to adopt emergency procedures for the evacuation and control of populated areas below such dams.

### *Title 23 Model Water Efficient Landscape Ordinance*

California Code of Regulations, Title 23, requires use of Smart Controllers and separate irrigation-only meters and rain sensors for water-conserving irrigation system design.

## Local

### *City of Pleasanton*

*General Plan*

The Pleasanton General Plan sets forth the following goals, policies, and programs that are relevant to hydrology and water quality:

- **Policy 1:** To ensure sustainability, promote the conservation of water resources.
  - **Program 1.1:** Prohibit water supply production policies and practices which would deplete groundwater resources below existing sustainable levels.
  - **Program 1.2:** Foster water conservation practices which do not allow depletion of groundwater and surface water resources to the extent that they cannot be replaced within the same water season.
  - **Program 1.4:** Work with Zone 7 Water Agency to investigate innovative and more efficient ways to recharge aquifers and other groundwater resources.
  - **Program 1.5:** Utilize cost-effective water reclamation and recycling techniques for the purpose of water conservation rather than as a new source of water which must be used to sustain new and existing development, where these techniques can be implemented without degrading surface water and groundwater quality.
  - **Program 1.7:** Require the installation of water conservation devices in new construction and additions.
  - **Program 1.13:** Plant drought-tolerant landscaping in appropriate locations. All landscaping aspects from plant selection to irrigation methods should be designed to reduce water demand, decrease runoff, and minimize impervious surfaces.
- **Policy 2:** Preserve and enhance streambeds and channels in a natural state.
  - **Program 2.4:** Design projects adjacent to the arroyos to protect habitat areas.
  - **Program 2.5:** Work with Zone 7 Water Agency to restore arroyos consistent with its Stream Management Master Plan.
  - **Program 2.7:** Locate wetland buffers between a wetland and proposed, existing, or potential development. These buffers should be of sufficient width and size to protect species most sensitive to development and should be designed to complement the habitat value of the wetland resource.

- **Program 2.8:** Require that future developments result in no net loss of wetlands.
- **Policy 3:** Protect the quality and quantity of surface water and groundwater resources in the General Plan Area.
  - **Program 3.4:** To preserve areas with prime percolation capabilities, regulate projects that use toxic chemicals including herbicides in water recharge areas, such as adjacent to arroyos.
  - **Program 3.6:** Prohibit new septic systems, automobile dismantlers, waste disposal facilities, industries utilizing toxic chemicals, and other potentially polluting uses in areas where pollution could impact flood waters, groundwater, streams, creeks, or reservoirs.
  - **Program 3.7:** To the extent compatible with the goal of maintaining water quality and public safety, retain water recharge areas, if feasible, as permanent open space accessible to the public.
  - **Program 3.9:** Support the policies and programs contained in the Water Quality Control Plan for the San Francisco Bay Basin to the extent they are consistent with the City's policies for water quality.
  - **Program 3.11:** Support Zone 7 in implementing its Stream Management Master Plan so as to protect and enhance the water quality of streams and groundwater.
  - **Program 4.5:** Utilize water reclamation methods to the fullest extent feasible, where safe and nonpolluting.
  - **Program 4.9:** In anticipation of planned future growth in Pleasanton, continue working with Zone 7 to plan and provide for sufficient future water supplies.

### *Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency)*

Alameda County Flood Control and Water Conservation District consists of 10 active zones, of which Zone 7 covers the eastern portion of Alameda County, which includes the cities of Dublin, Pleasanton, and Livermore, and adjacent portions of unincorporated Alameda County). Pursuant to Section 36 of the District Act, Zone 7 of this District (Zone 7 Water Agency, or Zone 7) was established in 1957 to address regional flood control and water supply issues.

In general, an encroachment permit is required for reviewing and inspecting proposed work of any nature that has the potential to impact any existing flood control or water supply facilities. Where buildout of the proposed Specific Plan would affect or be expected to affect a Zone 7 flood control channel, the development would have to obtain and comply with a Zone 7 encroachment permit.

*Stream Management Master Plan*. Zone 7, in pursuing its flood control mission, has developed a Stream Management Master Plan in collaboration with Tri-Valley cities, park districts, businesses, and other stakeholders. The heart of the Plan is the Chain of Lakes, which will store excess water and protect the Tri-Valley area against flooding from 100- and 500-year storm events.

*Master Water Recycling Permit*. In July 1992, Section 13523.1 was added to the California Water Code, authorizing RWQCBs to issue master reclamation permits to a producer and/or distributor of recycled water in lieu of prescribing individual water reuse requirements for a user of recycled water.

*Zone 7 Salt Management Plan*. In May 2004, Zone 7, in cooperation with the other agencies, published the Salt Management Plan to address the increasing level of Total Dissolved Solids in the

Main Basin. The Plan was approved by the RWQCB in October 2004 and was incorporated into Zone 7's Groundwater Management Plan in 2005.

### *City of Pleasanton Municipal Code*

The City of Pleasanton has incorporated stormwater and stormwater quality regulations into its municipal code, which are included in the following code chapters: Chapter 9.14 Storm Water Management and Discharge Control, Chapter 9.30 Water Conservation Plan, Chapter 13.04. Encroachments, Chapter 15.16 Connections to Sewerage Systems, Chapter 15:24 Sewer Service Regulations, Chapter 15.28 Sewer Use Regulations, Chapter 15.36 Wastewater Discharge Permits, Chapter 17.08 Flood Damage Protection, and Chapter 19.40 Improvements.

## 3.8.4 - Methodology

FirstCarbon Solutions evaluated impacts on Hydrology through, among other data and materials, review of the City of Pleasanton General Plan, 2015 Urban Water Management Plan, the HVSP, the HVSP FEIR, and site plans. Agency websites were reviewed for relevant information about facilities and services provided.

## 3.8.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hydrology and water quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

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

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?

c) Substantially alter the existing drainage pattern of 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?

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 amount of surface runoff in a manner, which would result in flooding on- or off-site?

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

f) Otherwise substantially degrade water quality?

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

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

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?

j) Inundation by seiche, tsunami, or mudflow?

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A FEIR was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to hydrology and water quality and found that the project would have a potentially significant impact on hydrology and water quality without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR. As shown in Appendix J, Mitigation Measures G2, G3, G6 through G11 would not be applicable. Mitigation Measures G1, G4, and G5 would be included. These mitigation measures, applied to the HVSP in relation to hydrology, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen potential hydrology and water quality impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation as envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to hydrologic resources. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.8.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

### Water Quality

| | |
|---|---|
| **Impact HYD-1:** | **The project may have the potential to violate any water quality standards or waste discharge requirements.** |

#### *Impact Analysis*

The project would consist of the development of 39 single-family residences on approximately 31 acres and would permanently preserve approximately 80 acres as open space. The proposed project would disturb more than one acre of soil and therefore is required to obtain coverage under the SWRCB General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ).

*Construction*

Grading activities could result in erosion and sedimentation. The accumulation of sediment could result in the blockage of flows, potentially causing increased localized ponding or flooding.

Construction activities would require the use of gasoline and diesel-powered heavy equipment, such as bulldozers, backhoes, water pumps, and air compressors. Chemicals such as gasoline, diesel fuel, lubricating oil, hydraulic oil, lubricating grease, automatic transmission fluid, paints, solvents, glues, and other substances could be used during construction. An accidental release of any of these substances could degrade the quality of the surface water runoff and adversely affect receiving waters. The project would be required to comply with all applicable laws and regulations governing water quality during construction.

The Construction General Permit requires the development and implementation of a SWPPP. The SWPPP should contain a site map(s) that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography (both before and after construction), and drainage patterns across the project. The SWPPP must list BMPs that the discharger will use to protect stormwater runoff and the placement of those BMPs. BMP implementation shall be consistent with the BMP requirements in the then most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction or the Caltrans Stormwater Quality Handbook Construction Site BMPs Manual. Additionally, the SWPPP must contain a visual monitoring program and a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs. Furthermore, the SWPPP shall be prepared by a Construction General Permit Qualified SWPPP Practitioner (QSP) in order to ensure the SWPPP is implemented effectively. Adherence to the General Permit would reduce impacts to water quality from construction activities to a less than significant level.

*Operations*

Operational activities would involve vehicle use, landscape maintenance, and routine maintenance of structures. Leaks of fuel or lubricants, tire wear, brake dust, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals and sediment, which may result in the pollutant load in runoff being transported to receiving waters. Runoff from landscaped areas may contain residual pesticides and nutrients. Consequently, the long-term degradation of runoff water quality in downstream waterways could result from the implementation of the project. However, the project would be required to comply with Chapter 9.14 Stormwater Management and Discharge Control of the City of Pleasanton Municipal Code. Chapter 9.14, also known as the City of Pleasanton Stormwater Management and Discharge Control Ordinance, requires implementation of BMPs and compliance with general permits. Design features would comply with the County's current NPDES permit and Clean Water Program Stormwater C.3 Guidebook. Compliance with the Stormwater Management and Discharge Ordinance would ensure the implementation of stormwater quality control measures during operational activities to prevent pollutants from entering downstream waterways. As such, operational impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Groundwater

| | |
|---|---|
| **Impact HYD-2:** | **The project would not 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.** |

### *Impact Analysis*

As described previously, the City purchases approximately 80 percent of its water from Zone 7 Water Agency and obtains the remaining approximately 20 percent from groundwater. The City owns and operates three active groundwater wells in the Main Basin, which is a portion of the Livermore Valley Groundwater Basin. Through a mutual agreement with the Zone 7 Water Agency, the City of Pleasanton has a groundwater-pumping quota (GPQ) of 3,500 acre-feet per year (afy).

The Main Basin is the portion of the Livermore Valley Groundwater Basin that has high yields and good quality groundwater. The Main Basin has an estimated storage capacity of 254,000 AF and receives an annual average natural recharge of approximately 13,400 afy. This recharge is considered the long-term natural sustainable yield of the Main Basin. Historical groundwater pumpage from 2011 to 2015 has been about 3,500 AF, equal to the City's GPQ.

The project would demand up to approximately 16.60 acre-feet of potable water annually; refer to Section 3.12, Utilities for further discussion. Water for the Residential Development Area of the project would be supplied by multiple water sources: Imported surface water from the State Water Project, imported water surface water transferred from the Byron Bethany Irrigation District, or local surface water runoff from the Del Valle Reservoir. These sources of water originate primarily from surface water, and, therefore, the project would not deplete groundwater supplies. No new on-site groundwater wells would be drilled as part of the project. The project would connect to an existing 12-inch water line on Westbridge Lane and Alisal Street. Furthermore, a majority of the approximately 154-acre project site would remain undeveloped. Storm drainage from impervious surfaces proposed on the Residential Development Area would be directed to an on-site bioretention basin where infiltration could occur. As such, the project would not substantially interfere with groundwater recharge.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Drainage

**Impact HYD-3:** **The project would not substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial surface runoff, flooding on- or off-site, erosion or siltation on- or off-site.**

### *Impact Analysis*

The vast majority of the approximately 154-acre project site would be left undeveloped and existing drainage would not be modified. No impervious surfaces would be constructed outside the Residential Development Area and drainage would continue to be directed to existing natural drainages.

The approximately 31-acre portion of the project site that would be developed would substantially alter the landscape, and may affect the existing natural drainage pattern on the project site. Grading and construction may temporarily alter stormwater flow patterns; however, compliance with the General Construction permit conditions and the applicable provisions of the Municipal Code would lessen impacts. Refer to Section 3.12, Utilities for further discussion.

The project would require the installation of new on-site storm drainage infrastructure. The on-site storm drainage system would consist of a network of street gutters, inlets, basins, and underground piping that would ultimately convey runoff to five different detention basins. The detention basins and bio retention areas would conform to all the 2015 Alameda County C3 Stormwater guidelines. The proposed project's landscaping plans feature groundcover and turf to increase infiltration rates and reduce runoff volumes and erosion and sedimentation. As described previously, the project would be required to comply with Chapter 9.14 Stormwater Management and Discharge Control of the City of Pleasanton Municipal Code. Chapter 9.14, also known as the City of Pleasanton Stormwater Management and Discharge Control Ordinance, requires implementation of BMPs and compliance with general permits.

The provision of the on-site stormwater infrastructure would ensure that the project would not result in substantial erosion. The proposed project would not create or contribute runoff water that would exceed the capacity of the drainage system. Adherence to all applicable regulations from the Alameda County Clean Water Program, City of Pleasanton Municipal Code, and State Water Board would reduce impacts to less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Stormwater

**Impact HYD-4: The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.**

### *Impact Analysis*

The project site consists of mostly undeveloped land and does not include any existing utility infrastructure. Existing water, wastewater, and stormwater infrastructure is located immediately adjacent, within Alisal Street and Westbridge Lane. The construction of new stormwater drainage facilities would connect to the existing facilities mentioned above.

Development of the proposed residential units would result in a net increase of impervious surfaces from buildings, paved roadways and driveways. Increased runoff volume could exceed the capacity of downstream drainage components, causing localized flooding. As discussed above in Local Drainage, the HVSP noted there were areas in the project vicinity where flooding has been known to occur. However, the City of Pleasanton's Department of Engineering determined that there does not currently appear to be flooding issues associated with runoff from the Spotorno property and the proposed retention area could accommodate any anticipated runoff from the project. Five proposed drainage areas, which are discussed in further detail in Section 3.14, Utilities, feature bioretention areas, self-retaining basins and self-treating areas that would control the volume and flow of runoff on-site. Drought-tolerant landscape along with low-impact design would be used throughout the site. These BMPs would reduce the volume and flow rate of stormwater from the site to the storm sewer system to the maximum practicable extent. Compliance with the HVSP, Alameda County Clean Water Program, City of Pleasanton Municipal Code, and State Water Board General Permit would reduce impacts to less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Water Quality

**Impact HYD-5: The project would not otherwise substantially degrade water quality.**

### *Impact Analysis*

**Less than significant impact**. As described above, the proposed project would result in the construction of 39 residential units. Construction of the residential portion would include excavation of soils and development of new structures and pervious surfaces. As part of the project design, several drainage management areas would be constructed to control and direct stormwater flow toward treatment areas. There are existing water pipelines located along Alisal Street and

Westbridge Lane, to which the project would connect. The project will adhere to the General Construction Permit and Alameda County Clean Water Program guidelines to prevent erosion, flooding, and surface runoff. With adherence to these guidelines and regulations, impacts associated with water quality would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## 100-year Flood Zones

| | |
|---|---|
| **Impact HYD-6:** | **Development and land use activities contemplated by the proposed project would not place housing or other land uses within a 100-year flood hazard area as mapped on a federal Flood Insurance Rate Map nor place structures within a 100-year flood zone which would impede or redirect flood flows.** |

### *Impact Analysis*

The project site is not located within a 100-year flood hazard area. The project site is located in Zone X, an area of minimal flood hazards. Residential units would not be affected by flood zones, as shown on FEMA Map 06001C0338G. Therefore, impacts are less than significant.

### *Level of Significance Before Mitigation*

Less than significant.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Dam Failure

| | |
|---|---|
| **Impact HYD-7:** | **The project would not 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.** |

### *Impact Analysis*

A majority of the City of Pleasanton falls within the 5- to 40-minute inundation area in the event of a Del Valle Dam failure. In 2002, the City adopted an evacuation plan as an amendment to its Comprehensive Emergency Management Plan. The project site is located roughly 7 miles west of the Del Valle Dam, and is not within the Del Valle Dam inundation area. The elevation of the project

site (ranging from 340 to 863 feet above mean sea level) and distance from the coast preclude potential inundation by coastal hazards, such as tsunamis, extreme high tides, or sea level rise.

### *Level of Significance Before Mitigation*

Less than significant.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Inundation

**Impact HYD-8: The project would not be inundation by seiche, tsunami, or mudflow.**

### *Impact Analysis*

The City of Pleasanton is more than 14 miles from the San Francisco Bay and therefore not susceptible to tsunamis. Susceptibility to landslides and or mudflow would be a less than significant impact as discussed in Section 7, Effects Found not to be Significant. Compliance with City regulations including a City Grading and Drainage Plan, Erosion Control Measures, and BMPs would reduce the risk of possible impacts related to mudflow. The nearest water bodies to the project site do not have the potential to inundate the project site during strong seismic shaking. Therefore, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# 3.9 - Land Use and Planning

## 3.9.1 - Introduction

This section describes the existing land use and planning setting and potential effects from implementation of the project within the project site on its surroundings. Descriptions and analysis in this section are based on the City of Pleasanton General Plan, the Happy Valley Specific Plan (HVSP), the HVSP Final EIR (FEIR), the General Plan EIR, and the Pleasanton Municipal Code.

## 3.9.2 - Environmental Setting

### Land Use

The 154-acre project site is located in the southern portion of the City of Pleasanton, Alameda County, California. The project site comprises two parcels (Assessor's Parcel Numbers 948-0015-002-01 and 949-0014-001-00) located in the southern portion of the City of Pleasanton, Alameda County, California. As shown in Exhibit 2-2, the site is roughly bounded by Alisal Street on the west, Westbridge Lane to the south and undeveloped hills to the east. The topography of the site is varied, with hills and ridgelines in the in the northern and eastern portions of the site (Spotorno Hill) and flat terrain in the west (Spotorno Flat Area). Surrounding land uses include large-lot residential home sites to the west, northwest, and southwest; the Faith Chapel Assembly of God Church to the southwest; and the Callippe Preserve Golf Course and adjoining residences to the south. The City's urban growth boundary generally follows the alignment of Minnie Street and continues to the east approximately following the alignment of Sycamore Creek.

#### *Project Site*

The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel Assembly of God church. Cattle are grazed on the site. An approximately 20-foot-tall windmill that powers an irrigation well to irrigate the property for cattle is located within the Spotorno Flat Area. Located in the east portion of the project site, over the crest of the hilly terrain are five ancillary structures (per aerial). A residence located on Lot 96 of the HVSP, adjacent to the far northern edge of the project site, is not part of this project.

The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 31 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acres) contains hilly terrain with steep slopes. Elevations on-site range from approximately 380 feet above mean sea level within the Spotorno Flat Area portion of the project site to approximately 736 feet above mean sea level at the crest of the hills east in the Spotorno Hills. Scattered oak trees are located along the ridgetops and clustered within ravines. No streams are located within the project site boundaries. There are four wetlands within the project site, three of which adjoin the hillside as it slopes upwards from the Spotorno Flat Area.

### *Surrounding Area*

Surrounding land uses include large lot rural residential uses to the west, northwest, and southwest; the Faith Chapel Assembly of God Church to the southwest; the Callippe Preserve Golf Course and single-family residential uses to the south, and open space to the east.

*West*

The project site is bounded by Alisal Street, large-lot rural residential properties, and undeveloped land that spans further west. Existing trees are located sparsely along west side of Alisal Street, and the undeveloped land mostly consists of grasslands. Alisal Street and properties to the west of Alisal Street are located in unincorporated Alameda County.

*North*

Directly to the north of the Spotorno Flat Area are single-family residential properties that were recently annexed to the City. Large-lot residential properties are located along the northwest boundary of the project site, and extend north from the Spotorno Upper Valley Area. The northernmost portion of the project site is located adjacent to Minnie Street (a private street providing access to and from the Spotorno Residence) and is near a low-density, single-family residential neighborhood located on Sycamore Creek Way. A city water tank is located to the vicinity to north and serves the neighborhoods north of the project site. To the north and northeast of this water tank is hilly, open space grasslands. The City has recently approved a low-density residential development that has not yet been constructed.

*East*

The area to the east of the project site predominantly consists of open space grasslands within hilly terrain and scattered oak trees along the ridgetops and clustered within ravines. This area is located outside the City's Urban Growth Boundary (UGB) line. A city water tank is located slightly northeast of the project site.

*South*

The project site is bounded to the south by Westbridge Lane and Faith Chapel Assembly of God church. The City's Callippe Preserve Golf Course is located directly south of Westbridge Lane, wrapping around six residential lots that face onto Westbridge Lane. Adjacent land uses to the southeast include four residential properties near the intersection of Westbridge Lane and Clubhouse Drive.

## Land Use Designations

### *City of Pleasanton*

*General Plan*

The City General Plan is the policy document that guides the long-range development of land and the conservation of resources in Pleasanton, and with which all other city ordinances and policies must be consistent.

The City adopted the current General Plan 2005–2025 in July 2009. The Housing Element was amended and adopted in 2015. The 2005–2025 General Plan designates the project site Low

Density Residential, Medium Density Residential, and Open Space—Public Health and Safety as shown in Exhibit 2-13. Per the General Plan, in the Happy Valley area the density allowed is one dwelling unit per two gross acres, with one unit per 1.5 gross acres when developed in conjunction with major open space land or agricultural/open space easement dedication.[1]

*Happy Valley Specific Plan*

The HVSP applies three different land use designations to different areas of the project site: PUD—Medium Density Residential (PUD-MDR); PUD—Semi-Rural Density Residential (PUD-SRDR); and PUD—Agriculture/Open Space (PUD-AG/OS). Exhibit 2-14 in Section 2, Project Description shows the project site's existing land use designations. Since the project includes a request to re-designate the Spotorno Flat Area to PUD-LDR, a description of this land use designation is included below.

- **PUD-LDR:** The land uses within the PUD-LDR subarea include single-family detached and attached housing, household pets, accessory structures and uses including private garage, living area without kitchen, enclosed storage, and greenhouse, common recreation areas, small family daycare home, and public trails. Development standards for the PUD-LDR designation include the following:
  - **Site Development Standards:**
    (1) Minimum parcel size, parcel dimensions, building setbacks, and maximum building height are to be determined at the time of PUD development plan approval.
    (2) Accessory structure height and yard setbacks are to be determined at the time of PUD development plan approval.
    (3) Minimum parking is two garage-parking spaces with four total on-site spaces.
    (4) In regards to view corridors, the siting and height of homes and other buildings located in the vicinity of the northern property line of the Golf Course Properties shall be established based upon providing maximum view potential of the Golf Course from the southern Alisal Street area.
  - **Design Guidelines:** To be determined at the time of PUD development plan approval.
  - **Maximum Allowable Units:** Within this Specific Plan Subarea, there are five maximum allowable units within an approximately 5 acre area (refer to Table 2-2 in Section 2, Project Description).[2]

- **PUD-MDR:** Allows for the same land uses as PUD-LDR. Development standards include the following:
  - **Site Development Standards:** To be determined at the time of PUD development plan approval. A visual analysis shall be conducted for this area to evaluate the potential impacts of development on the outlying community in northwest Pleasanton. Measures shall be taken to minimize the off-site visibility of the development in this area to the greater extent feasible.
  - **Maximum Allowable Units:** Within this Specific Plan Subarea, there are 75 maximum allowable units within the approximately 15-acre area (refer to Table 2-2 in Section 2, Project Description).

[1] City of Pleasanton. Adopted 2009 and amended 2010. The City of Pleasanton General Plan 2005-2025, Land Use Element.
[2] The area referenced in the HVSP includes only the "Spotorno Upper Valley Area" and not the "Portion of the Golf Course Properties."

- **PUD-SRDR:** Allows for the same land uses as PUD-LDR; in addition, this designation allows for a farm animal lot of at least 40,000 square feet, an orchard/vineyard, and a public water or sewer pump station. Development standards include the following:
  - **Site Development Standards:**
    (1) Maximum density: one home per two acres (**Exception**: At the landowners' option, up to six additional parcels [22 total] may be permitted at the 33 acre PUD-SRDR portion of Lot 98 in return for major dedication of open space land or agriculture/open space easements to the City at the time of final subdivision map approval.
    (2) Minimum parcel size is one acre.
    (3) Minimum parcel dimensions: width—175 feet; depth—175 feet.
    (4) Minimum principal house setbacks: front yard—35 feet; side yards—25 feet; rear yard—35 feet.
    (5) Maximum principal house height: 30 feet, as measured from the highest to the lowest elevations of the building.
    (6) Minimum parking: Two garage-parking spaces with four total on-site spaces.
    (8) View corridors: The siting and height of structures and landscaping located on Lots 98, 99, and 100 shall be established based upon providing maximum view potential of the Golf Course from the vicinity of southern Alisal Street. In addition, larger lots concentrated near Alisal Street shall be integrated into the Lot 98 (Spotorno Flat Area) PUD development plan to provide maximum view potential of the Golf Course from the vicinity of southern Alisal Street. Smaller lots of not less than one acre in size shall be encouraged at the eastern end of the PUD-SRDR portion of Lot 98 in order to compensate for the larger lots near Alisal Street and the open space corridor.
    (9) A maximum floor area ratio of 25 percent for two-story buildings and 40 percent for one-story buildings shall be applied for new homes on Lot 98. One-story homes are encouraged in this area, and a minimum of six homes in the Spotorno Flat Area shall be limited to one story in height.
    (10) Vehicular access to future parcels on Lot 98 from Alisal Street may be considered during the PUD development plan review process for Lot 98.
    (13) The owner of Lots 97 and 98 may apply for PUD development plan approval of one "ranch compound" to consist of a single-family home and ranch buildings on this property. Development plan approval shall be contingent upon compliance with City design requirements of adequate visual screening of buildings from outlying areas of Pleasanton as demonstrated through a visual analysis.
  - **PUD Development Plan Review:** Existing lots located at least partially within the PUD-SRDR District and containing a total of six or more acres shall be subject to the standard PUD development plan review process in accordance with Section 18.68 of the Pleasanton Municipal Code. All other lots in the SRDR District shall be included in a single PUD development plan to be prepared and adopted by the City.
  - **Maximum Allowable Units:** Within this Specific Plan Subarea, there are 69 maximum allowable units within the approximately 279 acre area (refer to Table 2-2 in Section 2, Project Description).[3]

[3] The PUD-SRDR includes both the Spotorno Flat Area and Remainder areas of the Greater Happy Valley Subarea.

- **PUD-AG/OS:** Allows for the same land uses as PUD-LDR, as well as livestock grazing operations, field crops and horticultural specialties, other agricultural uses employed on the property within 5 years prior to annexation to the City, a water storage tank and pump station, and public open space and public trails. Development standards include the following:
  - **Site Development Standards:**
    (1) Minimum parcel size: parcel areas designated as Agriculture/Open Space may not be further subdivided.
    (2) Minimum parcel dimension are the same as existing A/OS area dimensions.
    (3) Minimum principal house setbacks: front yard—35 feet; side yards—25 feet; rear yard—35 feet.
    (4) Maximum principal house height: 30 feet, as measured from the highest to the lowest elevations of the building.
    (5) Minimum parking: Two garage-parking spaces with four total on-site spaces.
    (6) Accessory structures: maximum building height—25 feet; minimum front yard setback—35 feet; minimum side and rear yard setbacks for accessory structures of 100 square feet or less in area and 15 feet or less in height—10 feet; and minimum side and rear yard setbacks of accessory structures greater than 15 feet in height and/or 100 square feet in area—20 feet.
    (8) Open space/residential density considerations: When a parcel of land contains both PUD A/OS and PUD-SRDR designations, existing homes located in the PUD-A/OS portion of the parcel shall not be counted while calculating housing density for the PUD-SRDR portion of the parcel.
  - **Maximum Allowable Units**: There are no new units allowed within this Specific Plan subarea.

## 3.9.3 - Regulatory Framework

### Local

#### *City of Pleasanton*

*General Plan*

The City of Pleasanton General Plan 2005–2025 (General Plan), adopted July 21, 2009, provides a blueprint for anticipated growth and the conservation of resources. The City's General Plan is the official document used by decision-makers and citizens to guide the community's long-range development of land and conservation of resources. The General Plan contains a land use map, policies, and supporting information adequate for making informed decisions concerning the community's future.

The City's General Plan establishes the following goals, policies, and programs related to land use that are applicable to the project:

**Conservation and Open Space Element**

- **Goal 1:** Promote sustainability to preserve and protect natural resources and open space.
- **Goal 5:** Preserve and protect existing and proposed open space lands for public health and safety recreational opportunities, natural resources, sensitive viewsheds, and biological resources.

- **Policy 6:** Protect all large continuous areas of open space, as designated on the General Plan Map, from intrusions by urban development.
  - **Program 6.1:** Explore working with the Tri-Valley Conservancy or similar entities to use transfer of development rights and conservation easements to preserve open space.
  - **Program 6.3:** Preserve large blocks of open space land by encouraging the clustering of development.
  - **Program 6.4:** Investigate methods and pursue opportunities to retain areas designated on the General Plan Map as Open Space for permanent open-space use through acquisition, conservation easements, establishment of land trusts, etc.
  - **Program 6.5:** Encourage developers to publicly dedicate fee title to open space lands: (1) that are determined to have considerable public recreational, scenic, or natural resource value; (2) where operational costs can be met; and (3) where significant potential health or safety hazards do not exist. Developers should offer public access to the fullest extent possible.
  - **Program 6.6:** Develop zoning districts with open space uses appropriate for the adopted Open Space categories listed on the General Plan Map and that implement the policies and programs of the General Plan.

**Land Use Element—Overall Community Development**

- **Policy 4:** Allow development consistent with the General Land Use Map.

**Land Use Element—Residential**

- **Policy 8:** Preserve and Enhance the character of existing residential neighborhoods.
- **Policy 9:** Develop new housing in infill and peripheral areas which are adjacent to existing residential development, near transportation hubs or local-serving commercial areas
- **Policy 10:** Provide flexibility in residential development standards and housing type consistent with the desired community character.
- **Policy 11:** Residential density is determined by the General Plan density range or applicable specific plan as outlined below: Residential projects proposed for land designated as Low- and Medium-Density Residential should propose densities generally consistent with the average densities assumed for buildout of the General Plan, as shown in Table 2-3 of the General Plan Land Use Element.

**Land Use Element—Open Space**

- **Policy 19:** Preserve open space areas for the protection of public health and safety, the provision of recreational opportunities, use for agriculture and grazing, the production of natural resources, the preservation of wildlands, and the physical separation of Pleasanton from neighboring communities.
  - **Program 19.1:** Preserve open space by way of fee purchase, developer dedications, conservation and scenic easements, transfer of development rights, *Williamson Act* contracts, open-space zoning categories, and other means which may become available.
- **Policy 21:** Preserve scenic hillside and ridge views of the Pleasanton, Main, and Southeast Hills ridges.

*Happy Valley Specific Plan*

The HVSP was adopted by the City in 1998 as a means to develop a municipal golf course in Happy Valley, provide infrastructure opportunities for the planning area residents, and balance the concerns of those wishing to develop their properties with those wishing to retain the existing semi-rural characteristics of the area.[4] The HVSP's 860-acre planning area is located generally east of Interstate 680 and south of Sycamore Road. Prior to its approval, the HVSP area included 111 existing residential units and undeveloped land. The HVSP contemplated the development of a maximum of 183 new residences within its planning boundaries, construction of a new municipal golf course, and the construction of a "Bypass Road," linking Westbridge Lane and Sycamore Creek Way.

The HVSP establishes the following goals, policies, and programs related to land use that are applicable to the project:

**Land Use Goals**

- **Goal 1:** To provide guidance for coordinating development in the Happy Valley Area following annexation to the City of Pleasanton.
- **Goal 2:** To preserve the existing semi-rural character of the neighborhood
- **Goal 3:** To creatively guide future land use and development within the Plan Area to be compatible with existing development.
- **Goal 4:** To protect the natural environment to the fullest extend feasible.
- **Goal 5:** To minimize the impacts of vehicular traffic generated by future development.

**Land Use Objectives**

- **Objective 1:** To facilitate the orderly development of lands within the Specific Plan Area in a manner which:
  a. Is consistent with the Pleasanton General Plan;
  b. balances the potential potentially competing interests of current and future residents of the Plan Area, residents of surrounding residential neighborhoods, and the greater Pleasanton community; and
  c. provides individual property owners with a framework within which to develop independently, but in an orderly manner which is harmonious with a comprehensive plan for the entire Area.
- **Objective 2:** To perpetuate the existing semi-rural uses and lot patterns within in-fill portions of Happy Valley, while clustering homes on the Spotorno Property and the Golf Course Properties to preserve large areas of open space.
- **Objective 3:** To permanently preserve agriculture and open space lands located outside of the Urban Growth Boundary through means such as public acquisition and the dedication of agriculture and open space easements.
- **Objective 5:** To ensure compatibility between land uses within and adjacent to the Plan Area.

*City of Pleasanton Zoning Ordinance*

The Pleasanton Zoning Ordinance, Chapter 18 of the City Municipal Code has been enacted to provide a precise guide for the physical development of the City in such a manner as to achieve

[4] City of Pleasanton. 1998. HVSP. Page 1.

progressively the arrangement of land uses depicted in the General Plan adopted by the City Council. The ordinance also promotes the stability of existing land uses that conform with the General Plan and "to protect them from inharmonious influences and harmful intrusions."

The project site consists of three HVSP land use districts: PUD—Medium Density Residential (PUD—MDR); PUD—Semi-Rural Density Residential (PUD-SRDR); and PUD—Agricultural/Open Space (PUD-AG/OS). The Zoning Ordinance indicates that a PUD District is intended to encourage imagination and housing variety in the development of property of varying sizes and topography, avoiding the monotony of standard residential, commercial, and industrial developments. The PUD procedure ensures that the desires of the developer and the community are understood and approved prior to commencement of construction. Descriptions of the PUD districts specific to the HVSP are discussed under "Land Use Designations," above.

*Urban Growth Boundary (Measure FF)*

In November 1996, the voters of the City of Pleasanton approved Measure FF, requiring voter approval for all but minor refinements to the City's UGB. Areas outside the UGB line are generally suitable for the long-term protection of natural resources, large-lot agriculture and grazing, parks, and recreation, and similar uses. General Plan Land Use Element Policy 22 does not allow urban development beyond the UGB line.

Measure FF indicates that the southern location of the UGB line in Happy Valley is based on the physical terrain as it extends along the base of the steep hills that enclose the Happy Valley area. The 1996 Measure FF description of the UGB line, which corresponds to the base of the steep hills that enclose Happy Valley, would include the base of Spotorno Hill. (The voter-affirmed UGB map did not include any parcel lines, and it was mapped at a 3,000-foot to 1-inch scale that makes it challenging to precisely locate on a parcel map.) When the City updated its General Plan in 2005, a different mapping program was used, which plotted a slightly different UGB location on the project site. Consequently, the UGB line shown on the General Plan Land Use Map is proposed to be refined, through a minor UGB refinement, to more accurately correspond to the text in Measure FF. Measure FF includes the following language as it relates to the UGB line:

> The UGB to the south is based on physical terrain as it extends along the base of the steep hills that enclose the Happy Valley area. It is also situated in nearby hilly locations to accommodate future development which has been permitted by the General Plan for many years.

*City of Pleasanton Measures PP and QQ*

In the November 2008 general election, the City of Pleasanton voters adopted two ballot measures regarding General Plan policy[5]:

1. Save Pleasanton's Hills and Housing Cap (Measure PP), a voter initiative; and
2. The Pleasanton Ridgelines Protection and Growth Control Initiative (Measure QQ), a City Council measure.

[5] As subsequent litigation determined that Pleasanton's earlier voter adopted housing cap was in conflict with state law, those portions of Measures PP and QQ related to the housing cap are not discussed here.

These two measures were incorporated into the City's 2005–2025 General Plan, adopted by the City Council on July 21, 2009. Measure PP limits the placement of housing units and structures on slopes of 25 percent or greater or within 100 vertical feet of a ridgeline, and further limits grading on slopes of 25 percent or more or within 100 feet of a ridgeline to build residential or commercial structures. Measure PP exempts from these restrictions projects of 10 or fewer housing units on property that constitutes a single legal parcel, as of January 1, 2007.

Measure QQ reaffirms and readopts policies in the then existing General Plan to (A) preserve scenic hillside and ridge views of specific ridges; (B) study the feasibility of preserving large open space areas in the Southeast Hills; and (C) protect large contiguous areas designated as Open Space in the General Plan.

With the adoption of Measure PP, its provisions are included in the City's General Plan as follows:

- **Land Use Element—Program 21.3:** Ridgelines and hillsides shall be protected. Housing units and structures shall not be placed on slopes of 25 percent or greater, or within 100 vertical feet of a ridgeline. No grading to construct residential or commercial structures shall occur on hillside slopes 25 percent or greater, or within 100 vertical feet of a ridgeline. Exempt from this policy are housing developments of 10 or fewer units on a single property. Splitting, dividing, or subdividing a "legal parcel" to approve more than 10 housing units is not allowed.

With the adoption of Measure QQ, the re-adopted policies and program are set forth in the City's General Plan, as shown below.

- **Land Use Element—Policy 21:** Preserve scenic hillside and ridge views of the Pleasanton, Main and Southeast Hills ridges.
- **Land Use Element—Program 21.2:** Study the feasibility of preserving large open-space areas in the Southeast Hills by a combination of private open-space and a public park system.
- **Open Space Element—Policy 6:** Protect all large continuous areas of open space, as designated on the General Plan Map, from intrusion by urban development.

*Pleasanton Municipal Code*

The Pleasanton Municipal Code sets forth regulations to ensure that development and land use activities protect and promote the health, safety, comfort, convenience, prosperity, and general welfare of residents and businesses in the City. The Pleasanton Municipal Code consists of all ordinances adopted by the Pleasanton City Council.

## 3.9.4 - Methodology

FirstCarbon Solutions (FCS) personnel performed reconnaissance of the project site in February 2018. FCS documented existing conditions with digital photographs and notes; reviewed the City's General Plan and HVSP for provisions applicable to the project; and reviewed project plans for consistency with the relevant provisions of the City's Ordinance Code.

## 3.9.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether land use and planning impacts are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

a) Physically divide an established community?

b) Conflict with any 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?

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

### Happy Valley Specific Plan FEIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to land use and planning and found the project would have a potentially significant impact on land use and planning without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR. The project would adhere to the site development standards and design guidelines as provided in the "Timing of Implementation for Site Development Standards, and Design Guidelines" table for Mitigation Measure A1. Mitigation Measures A2 and A3 are also applicable to the project. Mitigation Measure A4 is the same as C4, which is discussed in greater detail in Section 3.10, Noise. These mitigation measures, applied to the HVSP for land use, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the land use and planning impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation as envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to land use and planning. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.9.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

## Conflict with Applicable Plans, Policies, or Regulations

**Impact LUP-1: The project would not physically divide an established community.**

### *Impact Analysis*

The implementation of the proposed project would convert a portion of the mostly undeveloped 154-acre project site consisting of agricultural use and open space to include 39 home sites on approximately 31 acres within the Spotorno Flat Area portion of project site. Approximately 80 acres would be dedicated as permanent agricultural open space.

The physical division of an established community refers to the construction of a linear feature, such as an interstate highway or railroad tracks, or removal of a means of access that would impact mobility within an existing community. The project would install a traffic barrier along Westbridge Lane to prohibit through traffic (emergency vehicle access would be maintained); this improvement is identified within and therefore is consistent with the Happy Valley Specific Plan. Concurrently, access to the golf course neighborhood and the houses on Westbridge Land would be provided by the extension of Clubhouse Drive through the Spotorno Flat Area to connect to Alisal Street. Existing residents within the HVSP (i.e., existing home sites along the Callippe Reserve Golf Course community and along Alisal Street and Westbridge Lane) who utilize roadways that bound the project site would not lose the ability to access Happy Valley Road, and mobility would not be affected by the project buildout. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## General Plan and Specific Plan Consistency

**Impact LUP-2: The project would not conflict with any applicable provisions of the Pleasanton General Plan, the Urban Growth Boundary, or the Happy Valley Specific Plan, adopted for the purpose of avoiding or mitigating an environmental effect.**

### *Impact Analysis*

*General Plan*

The applicable General Plan policies for the project listed under Regulatory Framework, above, pertain to the character of the site, the consistency of development standards with adjoining properties, adherence to General Plan density requirements, and the City's general policy of protecting and preserving open space. As discussed below, the project would be designed to be consistent with the adjoining properties, and would include the permanent dedication of 80 acres of agricultural open space, which would be designated/zoned A/OS.

Project site development standards and density standards are discussed further under "HVSP Amendment," below.

The 2005–2025 General Plan designates the project site as Low Density Residential, Medium Density Residential, and Open Space—Public Health and Safety. The proposed project includes the development of 39 homes on approximately 31 acres (i.e., one unit per 1.25 acres) within the Spotorno Flat Area of the HVSP. This would be inconsistent with the existing General Plan.[6] The project includes the following general plan amendments:

- Modify the General Plan land use diagram for an approximately 11-acre area in the east portion of Spotorno Flat Area from Open Space—Public Health and Safety to Low Density Residential with a density of 1.25 units/acre. This modification is needed to align the boundaries of the land use district with the refined UGB line;
- Modify the General Plan land use diagram for an approximately 15 acre area in the northeast portion of the Spotorno Upper Valley Area from Medium Density Residential to Open Space—Agriculture and Grazing (Exhibit 2-13 in Section 2, Project Description);
- Change the maximum density allowed for the Spotorno Flat Area from one unit per 1½ gross acres (equivalent to 0.67 unit/acre) when developed in conjunction with major open-space land or agricultural/open space easement dedication; to 1.25 units/acre when developed in conjunction with major open-space land or agricultural/open space dedication;
- Refine the location of the Urban Growth Boundary (UGB) based on the 1996 voter-approved Measure FF to align with the base of Spotorno Hill consistent with the text of Measure FF. This change would also be formalized through a minor UGB refinement as shown in Exhibit 2-2 in Section 2, Project Description; and
- Eliminate the Bypass Road from the General Plan Circulation Element.

The proposed General Plan Amendments would be consistent with widely accepted planning principles of facilitating logical and orderly growth, ensuring compatibility with surrounding uses, and ensuring consistency with the goals and policies of the General Plan. When a project entails an amendment to the General Plan or zoning, inconsistency with the existing designation or zoning is an element of the project itself, which then necessitates a legislative policy decision by the agency and does not signify a potential environmental effect. As such, if approved, the proposed General Plan amendment would serve as a self-mitigating aspect of the project that would serve to correct conflicts that would otherwise exist, and impacts would be less than significant.

*Urban Growth Boundary (Measure FF)*

The General Plan Map includes the location of the Urban Growth Boundary as adopted in 2005. General Plan Land Use Element Policy 22 does not allow urban development beyond the UGB line. Because prior mapping was not spatially precise (described in more detail in Section 2, Project Description, and above in the subheading Urban Growth Boundary, Measure FF, on page 3.9-6), the

[6] City of Pleasanton. 2009. Pleasanton General Plan Land Use Map: 2005–2025. Website: http://www.cityofpleasantonca.gov /gov/depts/cd/planning/general.asp. Accessed March 7, 2017.

project will require a minor refinement to ensure the Map corresponds to the text in Measure FF as shown in Exhibit 2-2 in Section 2, Project Description. This is consistent with the Urban Growth Boundary as adopted because it is considered a minor refinement that would not require voter approval.

*Happy Valley Specific Plan*

The project site is within the HVSP and guided by the corresponding objectives, policies and general direction. The HVSP identifies objectives, policies, and design standards to simplify the subsequent planning process and allow for more efficient and timely approvals of uses. All new homes within the HVSP are required to follow the policies and general direction set forth in the HVSP for guiding growth.

The HVSP included buildout projections at its time of approval (1998). The HVSP contemplated the development of 183 homes in addition to the 111 homes then existing within the Specific Plan Area. Implementation of the proposed project, as discussed below, would result in 58 fewer homes than initially contemplated by the HVSP (see Table 2-2 in Section 2, Project Description). The project includes the following amendments to the HVSP:

- Change the Planned Unit Development—Medium Density Residential (PUD-MDR) land use/zoning designation in the Spotorno Upper Valley Area (Lot 97 and a small portion of Lot 98) to Planned Unit Development—Ag Open Space (PUD-OS);
- Change the Planned Unit Development—Semi-Rural Density Residential (PUD-SRDR) land use/zoning designation in the Spotorno Flat Area to Planned Unit Development—Low Density Residential (PUD-LDR);
- Change the maximum potential new residential units in the Spotorno Flat Area from 22 units to 39 units with major open space dedication
- Eliminate the Bypass Road and modify associated trail alignments.

Exhibit 2-15 in Section 2, Project Description demonstrates the project's proposed land use changes. Once amended, the HVSP would allow for the construction of 39 homes in the Spotorno Flat Area, instead of the 22 that would have been allowed under the HVSP. However, the project would also redesignate the MDR portion of the Spotorno Upper Valley Area to PUD-A/OS, resulting in a net reduction in the number of units on the project site as a whole, and retention of 124 acres of the property as open space, 80 acres of which would be permanently preserved as agricultural open space. The HVSP would also be amended to remove the requirement for development of the Bypass Road and trail through the eastern portion of the project site in conjunction with the residential development. The City will evaluate the merits of these proposed amendments as part of its review of the project application.

To implement the project, the project applicant is requesting to amend the HVSP land use plan, including the re-designation of the Spotorno Flat Area from PUD-Semi Rural Density Residential (PUD-SRDR) to PUD-Low Density Residential (PUD-LDR) and the re-designation of the PUD-Medium Density Residential (PUD-MDR) designation within the Upper Spotorno Valley area to PUD-Agriculture/Open Space (A/OS). When a project entails an amendment to the General Plan, a

Specific Plan, or zoning, inconsistency with the existing designation or zoning is an element of the project itself, which then necessitates a legislative policy decision by the agency and does not signify a potential environmental effect. As such, the proposed rezoning, if approved, would serve as a self-mitigating aspect of the project that would serve to correct a conflict that would otherwise exist.

The HVSP includes development standards and design guidelines for the PUD districts within the HVSP area. Therefore, development of the project site is determined through project review under the provisions of the PUD as set forth in the HVSP and described in more detail in Impact LU-3. It should be noted that the PUD-LDR designation is applied in the HVSP to parcels around/adjacent to the (then future) golf course, and, as stated in the HVSP, is intended to allow flexibility as to the configuration and to be refined to accommodate the golf course development. Development standards for the PUD-SRDR district are considerably more detailed, and in several instances are tailored to a particular development intent for specific properties in the greater Happy Valley area, including the Spotorno Property. While, as stipulated for the PUD-LDR district, the City would determine the appropriate development standards for the property through the PUD process, it will nonetheless reference and consider the guidance and intent of regulations otherwise provided for the Spotorno Property.

In general, the proposed project would conform to the minimum setbacks, height limits, and FAR requirements for the PUD-SRDR district. Lot sizes and dimensions would be somewhat smaller (consistent with the higher proposed density). With respect to site-specific development standards, the HVSP suggests that there be a transition from larger lots near Alisal Street, to smaller lots further east, in part to maintain view corridors along southern Alisal Street. The project would reflect this concept to some degree, and includes a bioretention/wetland area adjacent to Alisal Street, which provides an open space buffer along a substantial portion of the project frontage.

In these respects, the proposed project would therefore be generally consistent with the HVSP goals and objectives of the HVSP for (see Regulatory Framework, above) to preserve the semi-rural development of the HVSP, preserve open space, and maintain compatibility between properties within the HVSP. Impacts would be less than significant.

The HVSP FEIR (1998) acknowledged that adoption of the HVSP would result in the conversion of unimproved open space, largely utilized for livestock grazing, into housing and associated roadways. The conversion of agricultural land to residential was considered in the HVSP FEIR as a cumulative impact (Cumulative Impact A1 “Conversion of land for agricultural to urban use”) that cannot be mitigated. Cumulative impacts from the proposed project are discussed further in Section 4, Cumulative Effects.

*Compatibility with Surrounding Land Uses*

The project site is surrounded by a rural development and open space. The project has been designed to be compatible with surrounding land uses. All home sites would be limited to the Spotorno Flat Area portion of the project site, while the remaining portions of the project site (approximately 124 acres) would be designated/zoned A/OS, with approximately 80 acres dedicated as permanent agricultural open space. As discussed in Section 2, Project Description, the project would include design features compatible with the surrounding semi-rural character. Home sites

would be spaced consistently with the adjoining properties in the HVSP and would be built with architectural quality, color, and designs that are compatible with the HVSP development standards and design guidelines as well as the adjacent residences (see Exhibits 2-6 through 2-10). See also Section 3.1, Aesthetics, which discusses the impacts of the project on the character of the adjoining area. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Zoning and Other Regulation Consistency

| | |
|---|---|
| **Impact LUP-3:** | **The project would not conflict with any applicable provisions of the Pleasanton Municipal Code, or Measures PP and QQ, adopted for the purpose of avoiding or mitigating an environmental effect.** |

### *Impact Analysis*

*City of Pleasanton Municipal Code*

The project site is located with three HVSP land use districts as detailed above: PUD—Medium Density Residential (PUD-MDR); Planned Unit Development—Semi-Rural Density Residential (PUD-SRDR); and Planned Unit Development—Agriculture/Open Space (PUD-AG/OS).

All 39 homes proposed under the project would be developed in an area designated PUD-SRDR. PUDs are discussed in the City's Municipal Code under Title 18 Zoning, Chapter 18.68 "PUD Planned Unit Development District," and are intended to accomplish the following:

- To encourage imagination and housing variety in the development of property of varying sizes and topography in order to avoid the monotony and often destructive characteristics of standard residential, commercial and industrial developments;
- To provide a development procedure which will insure that the desires of the developer and the community are understood and approved prior to commencement of construction;
- To insure that the goals and objectives of the city's general plan are promoted without the discouragement of innovation by application of restrictive developmental standards;
- To encourage efficient usage of small, odd-sized or topographically affected parcels difficult for development by themselves;
- To accommodate changing market conditions and community desires;
- To provide a mechanism whereby the city can designate parcels and areas requiring special consideration regarding the manner in which development occurs;

- To encourage the establishment of open areas in residential, commercial and industrial developments and provide a mechanism for insuring that said areas will be beautified and/or maintained;
- To complement the objectives of the hillside planned development district (HPD) in areas not subject to the provisions of that zoning district.

Compliance with the Municipal Code would be implemented through the HVSP. As shown in Table 3.9-1, the project is consistent with all applicable objectives set forth in the HVSP for the proposed land uses (i.e., PUD-A/OS and PUD-LDR). Ultimately, the development potential of the site shall be determined through project review under the provisions of the PUD and the consistency determination is to be made by the City of Pleasanton (the legislative body). The following analysis provides substantial evidence to support that consistency determination, and a conclusion that impacts would be less than significant.

**Table 3.9-1: Happy Valley Specific Plan Consistency Analysis**

| District | Objective/ Design Guideline | Text | Consistency Determination |
|---|---|---|---|
| PUD-A/OS | a | Maintain the visually open character of the area. | **Consistent:** The project would not develop housing on the area that would be designated/zoned A/OS and would maintain the existing visually open character of the area. |
| | b | Maintain the agricultural character of the area. | **Consistent:** The project would permanently preserve approximately 80 acres as open space. The acreage would be designated/zoned A/OS and dedicated as permanent agricultural open space. Therefore, this area would maintain the agricultural character of the area. |
| PUD-LDR | 1 | Golf Course homes should be designed to enhance the view of the Golf Course area from the Bypass Road. New Golf Course homes are visible from the Bypass Road entry to Happy Valley should be designed and oriented to enhance the view of the area for arriving motorists | Not applicable to the project. |
| | 2 | The remaining design guidelines for the PUD-LDR District should be determined at the time of PUD development plan approval. | **Consistent:** The project would submit a PUD development plan that would set forth the allowable land uses, development standards, and other requirements for development of the project site. The PUD development plan would be subject to the City's review and approval process. |
| Source: FCs, 2018; Happy Valley Specific Plan, 1998. | | | |

*City of Pleasanton Measures PP and QQ*

The project site consists of the relatively flat Spotorno Flat Area in the west and hilly terrain located in the east and northeast portion of the project site. All development would occur within the Spotorno Flat Area portion of the project site, which consists of slopes of less than 10 percent (see Exhibit 2-3). The project site slopes upwards to the east into the Spotorno Hills at greater than 25 percent. As a part of the proposed project, the hillside portion of the project site with slopes greater than 10 percent would be would be designated/zoned A/OS with an open space (no development) easement, thereby permanently preserving it as agricultural open space.

The central purpose of Measure PP is to protect the natural and scenic environment. Measure PP limits the placement of housing units and structures on slopes of 25 percent or greater or within 100 vertical feet of a ridgeline. As discussed above, the proposed project would not be located on a slope greater than 20 percent. The eastern portions of lots 9-14 would include slopes greater than 10 percent but less than 25 percent, which is within the Measure PP threshold. All of the homes would be built on slopes of less than 10 percent. The project would be designed to be consistent with the character of the area, as discussed further in Section 3.1, Aesthetics. On this basis, the proposed project would therefore not conflict with Measure PP.

Measure QQ's readopted policies and programs apply, or are inapplicable, to the proposed project as follows:

- **Land Use Element—Policy 21:** Preserve scenic hillside and ridge views of the Pleasanton, Main and Southeast Hills ridges.
- **Land Use Element—Program 21.2:** Study the feasibility of preserving large open-space areas in the Southeast Hills by a combination of private open-space and a public park system.
- **Open Space Element—Policy 6:** Protect all large continuous areas of open space, as designated on the General Plan Map, from intrusion by urban development.

Land Use Element Policy 21 requires preservation of scenic hillside and ridge views of specific ridges. As detailed in Section 2, Project Description, the proposed project includes the permanent dedication of approximately 80 acres of open space within the Spotorno Hills portion of the project site. All development would occur within the Spotorno Flat Area, nestled below the adjacent hillsides. The project would therefore be consistent with Policy 21 discussed above. Furthermore, the General Plan Map designates the hillside portion of the project site "Open Space—Public Health and Safety." The project would permanent preserve approximately 80 acres. The project would therefore be consistent with Program 21.2. Furthermore, as the proposed project's development area is limited to the Spotorno Flat Area, the open space forms a large contiguous area as envisioned by Policy 6. Therefore, the proposed project would not conflict with the applicable direction of Measure QQ and subsequent General Plan policies and program. Impacts would be less than significant.

*Growth Management Ordinance*

Pursuant to the City's Growth Management Ordinance (Pleasanton Municipal Code Chapter 17.36), the project would require a Growth Management Allocation for the 39 proposed units. Approval of the allocation is at the City Council's discretion so long as the total annual citywide limit on new residential units for the year of application is not exceeded. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Conflict with Conservation Plans

**Impact LUP-4: The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan.**

### *Impact Analysis*

A significant impact would occur if the project would conflict with applicable habitat conservation plans (HCP) or natural community conservation plans.

The project site is not located within a habitat conservation plan or natural community conservation plan area. As discussed in Section 3.3, Biological Resources, the project would not conflict with any applicable HCPs or natural community conservation plans. Therefore, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# 3.10 - Noise

## 3.10.1 - Introduction

This section describes the existing noise setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on noise modeling performed by FirstCarbon Solutions (FCS). The noise modeling output is included in this Subsequent (SEIR) as Appendix G.

## 3.10.2 - Environmental Setting

### Characteristics of Noise

Noise is defined as unwanted sound. Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit, which expresses the ratio of the sound pressure level being measured to a standard reference level. The 0 point on the dB scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Changes of 3 dB or less are only perceptible in laboratory environments. Audible increases in noise levels generally refer to a change of 3 dB or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. Only audible changes in existing ambient or background noise levels are considered potentially significant.

A-weighted decibels (dBA) approximate the subjective response of the human ear to a broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies that are audible to the human ear.

Because decibels are logarithmic units, they cannot be added or subtracted by ordinary arithmetic means. For example, if one noise source produces a noise level of 70 dB, the addition of another noise source with the same noise level would not produce 140 dB; rather, they would combine to produce a noise level of 73 dB.

#### *Noise Descriptors*

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. 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 community noise equivalent level (CNEL) or the day-night average 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 noise 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 one dBA of each other and are normally exchangeable. The noise adjustments are added to the noise events occurring during the more sensitive hours.

Other noise rating scales of importance when assessing the annoyance factor include the maximum 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 are specified in terms of maximum levels denoted by $L_{max}$ for short-term noise impacts. $L_{max}$ reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

### *Noise Propagation*

From the noise source to the receiver, noise changes both in level and frequency spectrum. The most obvious is the decrease in noise as the distance from the source increases. The manner in which noise reduces with distance depends on whether the source is a point or line source, as well as ground absorption, atmospheric effects and refraction, and shielding by natural and manmade features. Sound from point sources, such as an air conditioning condenser, a piece of construction equipment, or an idling truck, radiates uniformly outward as it travels away from the source in a spherical pattern.

The attenuation or sound drop-off rate is dependent on the conditions of the land between the noise source and receiver. To account for this ground-effect attenuation (absorption), two types of site conditions are commonly used in noise models: soft-site and hard-site conditions. Soft-site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. For point sources, a drop-off rate of 7.5 dBA per each doubling of the distance (dBA/DD) is typically observed over soft ground with landscaping, as compared with a 6 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone and very hard packed earth. For line sources, such as traffic noise on a roadway, a 4.5 dBA/DD is typically observed for soft-site conditions compared to the 3 dBA/DD drop-off rate for hard-site conditions.

### *Traffic Noise*

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the Federal Highway Administration (FHWA) community noise assessment criteria, this change is “barely perceptible”; for reference a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

### *Stationary Noise*

A stationary noise producer is any entity in a fixed location that emits noise. Examples of stationary noise sources include machinery, engines, energy production, and other mechanical or powered equipment and activities such as loading and unloading or public assembly that may occur at commercial, industrial, manufacturing, or institutional facilities. Furthermore, while noise generated by the use of motor vehicles over public roads is preempted from local regulation, the County considers the use of these vehicles a stationary noise source when operated on private property

such as at a truck terminal or warehousing facility. The emitted noise from the producer can be mitigated to acceptable levels either at the source or on the adjacent property through the use of proper planning, setbacks, block walls, acoustic-rated windows, dense landscaping, or by changing the location of the noise producer.

The effects of stationary noise depend on factors such as characteristics of the equipment and operations, distance and pathway between the generator and receptor, and weather. Stationary noise sources may be regulated at the point of manufacture (e.g., equipment or engines), with limitations on the hours of operation, or with provision of intervening structures, barriers or topography.

Construction activities are a common source of stationary noise. Construction-period noise levels are higher than background ambient noise levels but eventually cease once construction is complete. Construction is performed in discrete steps, each of which has its own mix of equipment and, consequently, its own noise characteristics. These various sequential phases would change the character of the noise generated on each construction site, and therefore, would change the noise levels 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. Table 3.10-1 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

**Table 3.10-1: Typical Construction Equipment Maximum Noise Levels, $L_{max}$**

| Type of Equipment | Specification Maximum Sound Levels for Analysis (dBA at 50 feet) |
|---|---|
| Impact Pile Driver | 95 |
| Auger Drill Rig | 85 |
| Vibratory Pile Driver | 95 |
| Jackhammers | 85 |
| Pneumatic Tools | 85 |
| Pumps | 77 |
| Scrapers | 85 |
| Cranes | 85 |
| Portable Generators | 82 |
| Rollers | 85 |
| Dozers | 85 |
| Tractors | 84 |
| Front-End Loaders | 80 |
| Backhoe | 80 |
| Excavators | 85 |
| Graders | 85 |
| Air Compressors | 80 |

**Table 3.10-1 (cont.): Typical Construction Equipment Maximum Noise Levels, $L_{max}$**

| Type of Equipment | Specification Maximum Sound Levels for Analysis (dBA at 50 feet) |
|---|---|
| Dump Truck | 84 |
| Concrete Mixer Truck | 85 |
| Pickup Truck | 55 |
| Source: FHWA 2006. Highway Construction Noise Handbook. August. | |

### *Characteristics of Vibration*

Groundborne vibrations consist of rapidly fluctuating motions within the ground that have an average motion of zero. The effects of groundborne vibrations typically only cause a nuisance to people, but in extreme cases, excessive groundborne vibration has the potential to cause structural damage to buildings. Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. Groundborne noise is an effect of groundborne vibration and only exists indoors, since it is produced from noise radiated from the motion of the walls and floors of a room, and may also consist of the rattling of windows or dishes on shelves.

Several different methods are used to quantify vibration amplitude such as the maximum instantaneous peak in the vibrations velocity, which is known as the peak particle velocity (PPV) or the root mean square (RMS) amplitude of the vibration velocity. Because of the typically small amplitudes of vibrations, vibration velocity is often expressed in decibels—denoted as LV—and is based on the reference quantity of 1 micro inch per second. To distinguish vibration levels from noise levels, the unit is written as "VdB."

Although groundborne vibration can be felt outdoors, it is typically only an annoyance to people indoors where the associated effects of the shaking of a building can be notable. When assessing annoyance from groundborne vibration, vibration is typically expressed as root mean square (rms) velocity in units of decibels of 1 micro-inch per second, with the unit written in VdB. Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. Human perception to vibration starts at levels as low as 67 VdB. Annoyance due to vibration in residential settings starts at approximately 70 VdB.

Off-site sources that may produce perceptible vibrations are usually caused by construction equipment, steel-wheeled trains, and traffic on rough roads, while smooth roads rarely produce perceptible groundborne noise or vibration. Construction activities, such as blasting, pile driving and operating heavy earthmoving equipment, are common sources of groundborne vibration. Construction vibration impacts on building structures are generally assessed in terms of peak particle velocity (PPV). Typical vibration source levels from construction equipment are shown in Table 3.10-2.

## Table 3.10-2: Vibration Levels of Construction Equipment

| Construction Equipment | PPV at 25 Feet (inches/second) | RMS Velocity in Decibels (VdB) at 25 Feet |
|---|---|---|
| Water Trucks | 0.001 | 57 |
| Scraper | 0.002 | 58 |
| Bulldozer—small | 0.003 | 58 |
| Jackhammer | 0.035 | 79 |
| Concrete Mixer | 0.046 | 81 |
| Concrete Pump | 0.046 | 81 |
| Paver | 0.046 | 81 |
| Pickup Truck | 0.046 | 81 |
| Auger Drill Rig | 0.051 | 82 |
| Backhoe | 0.051 | 82 |
| Crane (Mobile) | 0.051 | 82 |
| Excavator | 0.051 | 82 |
| Grader | 0.051 | 82 |
| Loader | 0.051 | 82 |
| Loaded Trucks | 0.076 | 86 |
| Bulldozer—Large | 0.089 | 87 |
| Caisson drilling | 0.089 | 87 |
| Vibratory Roller (small) | 0.101 | 88 |
| Compactor | 0.138 | 90 |
| Clam shovel drop | 0.202 | 94 |
| Vibratory Roller (large) | 0.210 | 94 |
| Pile Driver (impact-typical) | 0.644 | 104 |
| Pile Driver (impact-upper range) | 1.518 | 112 |
| Source: Compilation of scientific and academic literature, generated by FTA and FHWA. | | |

The propagation of groundborne vibration is not as simple to model as airborne noise. This is because noise in the air travels through a relatively uniform medium, while groundborne vibrations travel through the earth, which may contain significant geological differences. Factors that influence groundborne vibration include:

- Vibration source;
- Type of activity or equipment, such as impact or mobile, and depth of vibration source;
- Vibration path: Soil type, rock layers, soil layering, depth to water table, and frost depth; and
- Vibration receiver: Foundation type, building construction, and acoustical absorption.

Among these factors that influence groundborne vibration, there are significant differences in the vibration characteristics when the source is underground compared to at the ground surface. In addition, soil conditions are known to have a strong influence on the levels of groundborne vibration. Among the most important factors are the stiffness and internal damping of the soil and the depth to bedrock. Vibration propagation is more efficient in stiff clay soils than in loose sandy soils, and shallow rock seems to concentrate the vibration energy close to the surface, and can result in groundborne vibration problems at large distance from the source. Factors such as layering of the soil and depth to the water table can have significant effects on the propagation of groundborne vibration. Soft, loose, sandy soils tend to attenuate more vibration energy than hard, rocky materials. Vibration propagation through groundwater is more efficient than through sandy soils. There are three main types of vibration propagation: surface, compression, and shear waves. Surface waves, or Rayleigh waves, travel along the ground's surface. These waves carry most of their energy along an expanding circular wave front, similar to ripples produced by throwing a rock into a pool of water. P-waves, or compression waves, are body waves that carry their energy along an expanding spherical wave front. The particle motion in these waves is longitudinal (i.e., in a "push-pull" fashion). P-waves are analogous to airborne sound waves. S-waves, or shear waves, are also body waves that carry energy along an expanding spherical wave front. However, unlike P-waves, the particle motion is transverse, or side-to-side and perpendicular to the direction of propagation.

As vibration waves propagate from a source, the vibration energy decreases in a logarithmic nature and the vibration levels typically decrease by 6 VdB per doubling of the distance from the vibration source. As stated above, this drop-off rate can vary greatly depending on the soil type, but it has been shown to be effective enough for screening purposes, in order to identify potential vibration impacts that may need to be studied through actual field tests. The vibration level (PPV) at a distance from a point source can generally be calculated using the vibration reference equation:

$$PPV = PPV_{ref} * (25/D)^n \text{ (in/sec)}$$

Where:

$PPV_{ref}$ = reference measurement at 25 feet from vibration source
D = distance from equipment to the receptor
n = vibration attenuation rate through ground

According to Chapter 12 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment manual (2006), an "n" value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.

## Existing Ambient Noise Levels

To understand the current ambient noise environment in the project vicinity, three noise measurements were taken at the project site and in the general project vicinity. These measurements provide a baseline for any potential noise impacts that may be created by development of the proposed project. Three short noise measurements were taken. The results of these measurements are described below and the noise survey sheets are provided in Appendix G of this SEIR.

### *Short-term Noise Measurements*

Short-term noise monitoring was conducted on February 8, 2018 between 11:30 a.m. and 12:20 p.m. The noise measurements were taken during the midday hours as the midday hours typically

have the highest daytime noise levels in urban environments. At the start of the noise monitoring, the sky was clear with minimal wind conditions ranging between 1 and 4 miles per hour (mph). The field survey noted that noise within the project area is generally characterized by local roadway traffic and birds. The short-term measurement results are summarized in Table 3.10-3. The noise measurement locations are shown in Exhibit 3.10-1.

**Table 3.10-3: Existing Noise Level Measurements**

| Site ID # | Description | $L_{eq}$ | $L_{min}$ | $L_{max}$ |
|---|---|---|---|---|
| ST-1 | Located near the southwest corner of the project site 50 feet away from Westbridge Lane | 52.6 | 37.1 | 74.4 |
| ST-2 | Located northwest of Church parking lot, 30 feet from where Alisal Street curves West | 50.9 | 37.2 | 65.9 |
| ST-3 | Located in the northwestern corner of the site 50 feet from Alisal Street | 45.5 | 37.6 | 58.3 |

Note:
The Site ID corresponds to locations shown in Exhibit 3.9-1.
Source: FirstCarbon Solutions 2017.

## Existing Traffic Noise Levels

Existing traffic noise levels along selected roadway segments in the project vicinity were modeled using the FHWA Traffic Noise Prediction Model (FHWA-RD-77-108). Site-specific information is entered, such as roadway traffic volumes, roadway active width, source-to-receiver distances, travel speed, noise source and receiver heights, and the percentages of automobiles, medium trucks, and heavy trucks that the traffic is made up of throughout the day, amongst other variables. The modeled roadway segments where chosen to reflect the roadway segments with the highest percentage of project trips based on the Traffic Impact Study (TIS) prepared by Fehr & Peers for the project (March 2018). The modeled average daily traffic (ADT) volumes were obtained by multiplying the PM peak-hour intersection traffic volumes from the project-specific traffic study by a factor of 10. The model inputs and outputs, including the 60 dBA, 65 dBA, and 70 dBA $L_{dn}$ traffic noise contour distances, are provided in Appendix I. A summary of the modeling results is shown in Table 3.10-4.

**Table 3.10-4: Existing Traffic Noise Levels**

| Roadway Segment | ADT | Centerline to 70 $L_{dn}$ (feet) | Centerline to 65 $L_{dn}$ (feet) | Centerline to 60 $L_{dn}$ (feet) | $L_{dn}$ (dBA) 50 feet from Centerline of Outermost Lane |
|---|---|---|---|---|---|
| Sunol Boulevard—I-680 off-ramp to Riddell Street | 18,100 | < 50 | 88 | 184 | 66.2 |
| Sunol Blvd—Riddell Street to Arlington Drive | 18,300 | < 50 | 88 | 185 | 66.3 |
| Sunol Blvd—Arlington Drive to Sycamore Road | 18,000 | < 50 | 88 | 183 | 66.2 |

**Table 3.10-4 (cont.): Existing Traffic Noise Levels**

| Roadway Segment | ADT | Centerline to 70 $L_{dn}$ (feet) | Centerline to 65 $L_{dn}$ (feet) | Centerline to 60 $L_{dn}$ (feet) | $L_{dn}$ (dBA) 50 feet from Centerline of Outermost Lane |
|---|---|---|---|---|---|
| Sycamore Road—Sunol Blvd. to Sycamore Creek Way | 2,500 | < 50 | < 50 | < 50 | 54.3 |
| Sycamore Road—Sycamore Creek Way to Amber Lane | 1,100 | < 50 | < 50 | < 50 | 50.7 |
| Happy Valley Road—Alisal Street to Unnamed Road | 410 | < 50 | < 50 | < 50 | 46.4 |
| Alisal Street—Happy Valley Road to Faith Chapel Assembly of God | 440 | < 50 | < 50 | < 50 | 41.9 |

Note:
ADT = Average Daily Traffic
Source: FirstCarbon Solutions 2017.

The modeling results indicate that traffic noise levels range up to approximately 41.9 dBA $L_{dn}$ at the southern boundary of the project site next Alisal Street and the Faith Chapel Assembly of God.

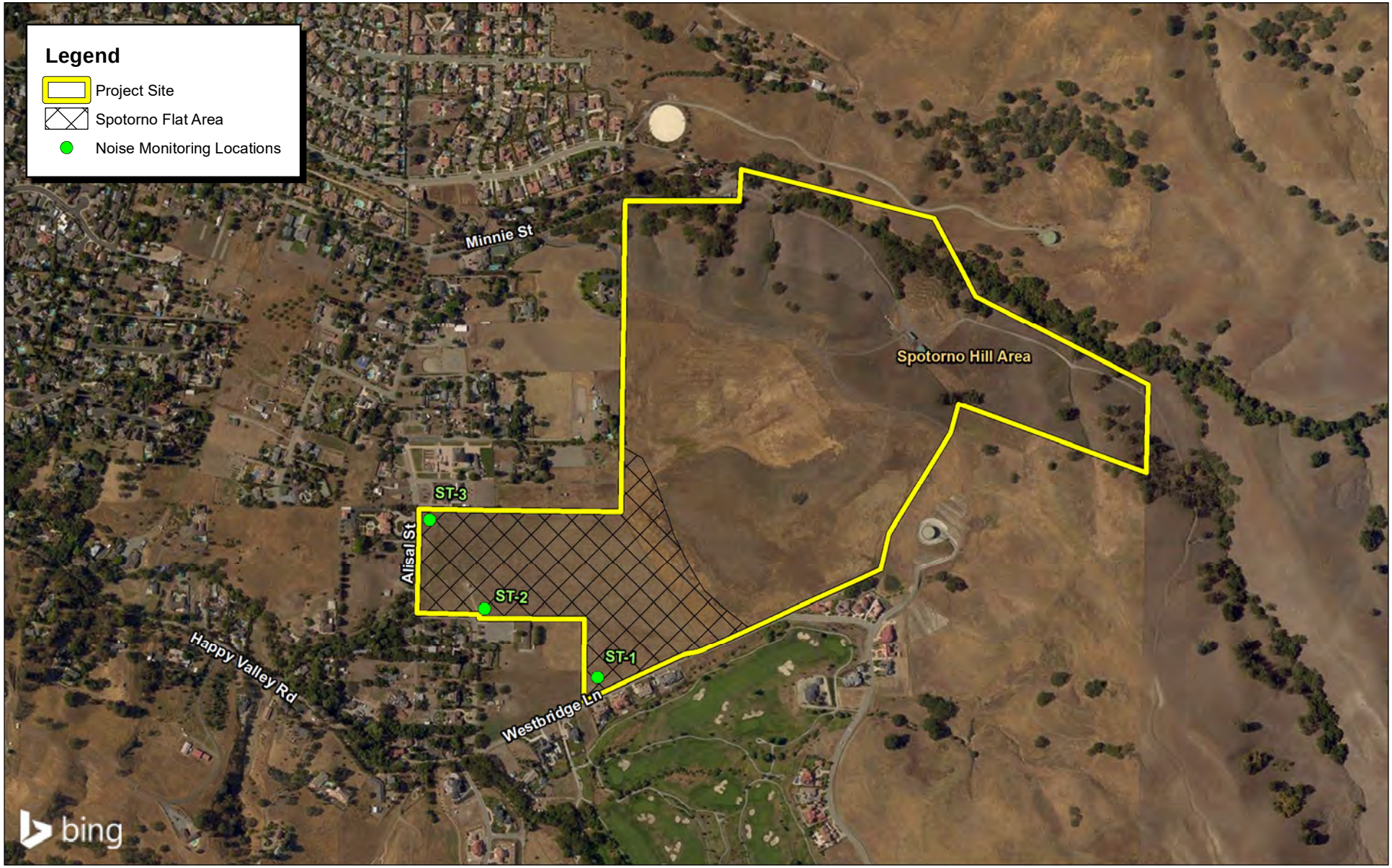
## 3.10.3 - Regulatory Framework

### Federal

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce
- Assisting state and local abatement efforts
- Promoting noise education and research

The Federal Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and interagency committees. For example, the Occupational Safety and Health Administration (OSHA) agency limits noise exposure of workers to 90 dB $L_{eq}$ or less for 8 continuous hours, or 105 dB $L_{eq}$ or less for 1 continuous hour. The Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies. The Federal Aviation Administration (FAA) regulates noise of aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the FTA. Transit noise is regulated by the federal Urban Mass Transit Administration (UMTA), while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). Finally, the federal government actively advocates that local jurisdictions use their land use regulatory authority to arrange new development in such a way that “noise sensitive” uses are either prohibited from being sited adjacent to a highway or, alternately, that the developments are planned and constructed in such a manner that potential noise impacts are minimized.




Source: bing Aerial Imagery. Ruggeri, Jensen, Azar, 2015.

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Exhibit 3.10-1
Noise Monitoring Locations

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Since the federal government has preempted the setting of standards for noise levels that can be emitted by the transportation sources, local jurisdictions are limited to regulating the noise generated by the transportation system through nuisance abatement ordinances and land use planning.

The Federal Transit Administration (FTA) has established industry accepted standards for groundborne vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment document (FTA 2006). The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 3.10-5.

**Table 3.10-5: Federal Transit Administration Construction Vibration Impact Criteria**

| Building Category | PPV (in/sec) | Approximate VdB |
|---|---|---|
| I. Reinforced-Concrete, Steel or Timber (no plaster) | 0.5 | 102 |
| II. Engineered Concrete and Masonry (no plaster) | 0.3 | 98 |
| III. Non Engineer Timber and Masonry Buildings | 0.2 | 94 |
| IV. Buildings Extremely Susceptible to Vibration Damage | 0.12 | 90 |
| Source: Federal Transit Administration 2006. Transit Noise and Vibration Impact Assessment. | | |

## State

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.

Government Code Section 65302 mandates that the legislative body of each county and city in California adopt a noise element as part of its comprehensive general plan. The local noise element must recognize the land use compatibility guidelines published by the State Department of Health Services. These guidelines rank noise and land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The City of Pleasanton has adopted and modified the State's land use compatibility guidelines as discussed in the following section.

## Local Regulations

The project site is located within the City of Pleasanton, in the County of Alameda. The City of Pleasanton addresses noise in the Noise Element of its General Plan (City of Pleasanton 2005) and in the City's Municipal Code (City of Pleasanton, 2017).

### *General Plan*

The City of Pleasanton General Plan establishes noise standards and policies for various land uses. The City's plan addresses land use compatibility, acceptable interior noise levels and substantial permanent increase criteria. These standards and policies are summarized below.

The City has established land use compatibility standards for residential and non-residential land uses (shown in Table 3.10-6). The land use category that is applicable to this project is single-family residential. Under this designation, noise environments with ambient noise levels up to 60 dBA $L_{dn}$ are considered "Normally Acceptable" for single-family residential land use developments. Noise environments with ambient noise levels from 60 dBA $L_{dn}$ to 75 dBA $L_{dn}$ are considered "Conditionally Acceptable" for single-family residential land use developments; under this circumstance, development may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features are included in the design. Conventional construction, but with closed windows and a fresh air supply system or air conditioning, will normally suffice as a noise insulation feature for these conditionally acceptable environments. In addition to its land use compatibility standards, the City has established acceptable interior noise levels for residential land uses. The standard for interior noise levels is 45 dBA $L_{dn}$.

The City has established its own substantial permanent increase criteria. According to the City's General Plan, an exterior increase of more than 4 decibels is considered significant.

The following goals, policies, and programs of the Pleasanton General Plan are applicable to the proposed project:

- **Goal 1**: Reduce noise to acceptable levels throughout the community.
- **Policy 1**: Require new projects to meet acceptable exterior noise level standards.
  - **Program 1.1**: Use the normally acceptable designation and text description contained in Table 11-5 [Table 3.10-6 in this document] "Noise and Land-Use Compatibility Guidelines," to determine the acceptability of new development and to determine when noise level standard of 60 dBA $L_{dn}$ for exterior noise in private or shared outdoor use areas studies are required. For new single-family residential development, maintain a maximum day/night average excluding front yards. For new multi-family residential development, maintain a maximum standard of 65 dBA $L_{dn}$ in community outdoor recreation areas (or 60 dBA $L_{dn}$ when the outdoor noise is due to aircraft). Noise standards are not applied to balconies or front yards. In the Downtown, the City Council will evaluate the requirement to achieve these standards on a case-by-case basis.
  - **Program 1.3**: Use noise guidelines and contours to determine the need for noise studies, and require new developments to construct or pay for noise attenuation features as a condition of approving new projects. An exterior increase of more than 4 decibels is considered significant.

- **Program 1.5**: Encourage the use of setbacks, landscaped earth berms, and frontage roads where feasible to reduce exterior noise levels. The use of soundwalls should only be used where other mitigation measures are not feasible. Where sound and frontage road walls are needed, design and high quality materials, as well as landscaping, should be used to mitigate their visual impact.

- **Policy 3**: Ensure that noise does not exceed interior noise levels of 45 dBA $L_{dn}$ for residential uses and those levels specified in noise studies for other uses.
  - **Program 3.2**: Require noise-attenuation measures when necessary to ensure that interior noise levels for new single- and multi-family residences do not exceed 45 dBA $L_{dn}$. Interior noise levels shall not exceed 45 dBA $L_{dn}$ in any new residential units (single and multi-family). Development sites exposed to noise levels exceeding 60 dBA $L_{dn}$ shall be analyzed following protocols in Appendix Chapter 12, Section 1208, A, Sound Transmission Control, 2001 (current) California Building Code, Section 1207.

### Table 3.10-6: Land Use Compatibility for Community Noise Environments

| Land Use Category | Community Noise Exposure $L_{dn}$ or CNEL, db | | | | | |
|---|---|---|---|---|---|---|
| | 55 | 60 | 65 | 70 | 75 | 80 |
| Single-Family Residential[a] | | | | | | |
| Multi-Family Residential, Hotels, and Motels[a] | | | | | | |
| Outdoor Sports and Recreation, Neighborhood Parks and Playgrounds | | | | | | |
| Schools, Libraries, Museums, Hospitals, Personal Care, Meeting Halls, Churches | | | | | | |
| Office Buildings, Business, Commercial, and Professional | | | | | | |
| Auditoriums, Concert Halls, Amphitheaters | | | | | | |

Key:

[a] In noise environments resulting primarily from railroad trains, exterior noise levels up to 70 dBA $L_{dn}$ are normally acceptable recognizing that day-night average noise levels are controlled by intermittent, loud events.

[b] <65 dBA outdoors = < 45 dBA indoors

| | |
|---|---|
| | Normally Acceptable: Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special insulation requirements |
| | Conditionally Acceptable: Specified land use may be permitted only after detailed analysis of the noise reduction requirements and needed noise insulation features included in the design. |
| | Unacceptable: New construction or development should generally not be undertaken because mitigation is usually not feasible to comply with noise element policies. |

### *Municipal Code*

The City of Pleasanton Municipal Code Chapter 9.04 establishes noise performance standards for residential, commercial, and industrial land uses. Additionally, the Municipal Code establishes acceptable noise levels and permissible hours for construction activities. These ordinances are summarized below.

*Stationary Noise Limits (Section 9.04.030)*

- Noise Limits—Residential property
  - Residential Property: No person shall produce or allow to be produced by any machine, animal, device, or any combination of the same, on residential property, noise level in excess of 60 dBA at any point outside of the property plane, unless otherwise provided in this chapter.
  - Multifamily Residential Property: No person shall produce or allow to be produced by any machine, animal, device, or any combination of the same, on multi-family residential property, a noise level in any dwelling unit in excess of 60 dBA except within the dwelling unit in which the noise source or sources originate. For purposes of this section, measurement of the noise level shall be taken at least four feet from any wall, floor or ceiling inside any dwelling unit on the same property with the windows and doors of the dwelling unit closed.

*Construction Noise (Section 9.04.100)*

- Between the hours of 8:00 a.m. and 8:00 p.m. daily, except Sunday and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration or repair activities which are authorized by a valid city permit shall be allowed if they meet at least one of the following noise limitations:
- No individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet. If the device is housed within a structure on the property, the measurement shall be made outside the structure at a distance as close to 25 feet from the equipment as possible; or
- The noise level at any point outside of the property plane of the project shall not exceed 86 dBA.

## 3.10.4 - Methodology

### Noise Measurement Methodology

To ascertain the existing noise at and adjacent to the project site, field monitoring was conducted on Thursday, February 8, 2018. The purpose of this noise monitoring was to document the existing noise environment and capture the noise levels associated with operations or activities in the project area. The average ambient noise levels documented at the site ranged on average from 45.5 dBA $L_{dn}$ to 52.6 dBA $L_{dn}$. The field surveys (Appendix G) noted that noise within the project study area is generally characterized by vehicle traffic on the local roadways.

The short-term noise measurements were taken using Larson-Davis Model LxT2 Type 2 precision sound level meters programmed in “slow” mode to record noise levels in “A” weighted form. The sound level meter was calibrated using a Larson-Davis calibrator, Model CAL 150. The accuracy of the calibrator is maintained through a program established through the manufacturer and is

traceable to the National Bureau of Standards. All noise level measurement equipment meets American National Standards Institute specifications for sound level meters (S1.4 1983 identified in Chapter 19.68.020.AA).

### Traffic Noise Modeling Methodology

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate traffic-related noise conditions in the vicinity of the project site. Traffic data used in the model was obtained from the Fehr & Peers Traffic Impact Study (TIS) prepared for the project (March 2018). The resultant noise levels were weighed and summed over a 24-hour period in order to determine the $L_{dn}$ values. The FHWA-RD-77-108 Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level. Adjustments are then made to the reference energy mean emission level to account for the roadway active width (the distance between the center of the outermost travel lanes on each side of the roadway); the total average daily traffic (ADT) and the percentage of ADT that flows during the day, evening, and night; the travel speed; the vehicle mix on the roadway; a percentage of the volume of automobiles, medium trucks, and heavy trucks; the roadway grade; the angle of view of the observer exposed to the roadway; and the site conditions ("hard" or "soft") as they relate to the absorption of the ground, pavement, or landscaping.

The level of traffic noise depends on the three primary factors: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater number of trucks. Vehicle noise is a combination of the noise produced by the engine, exhaust, and tires. Because of the logarithmic nature of traffic noise levels, a doubling of the traffic volume (assuming that the speed and truck mix do not change) results in a noise level increase of 3 dBA. Based on the FHWA community noise assessment criteria, this change is "barely perceptible." For reference, a doubling of perceived noise levels would require an increase of approximately 10 dBA. The truck mix on a given roadway also has an effect on community noise levels. As the number of heavy trucks increases and becomes a larger percentage of the vehicle mix, adjacent noise levels increase.

The model analyzed the noise impacts from the nearby roadways onto the project vicinity, which consists of the area that has the potential of being impacted from the on-site noise sources as well as the project-generated traffic on the nearby roadways. The roadways were analyzed based on a single-lane-equivalent noise source combining both directions of travel. A single-lane-equivalent noise source exists when the vehicular traffic from all lanes is combined into a theoretical single lane that has a width equal to the distance between the two outside lanes of a roadway, which provides almost identical results to analyzing each lane separately where elevation changes are minimal.

## 3.10.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, noise impacts resulting from the implementation of the proposed project would be considered significant if the project would cause:

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?

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

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

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

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?

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?

## Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to noise and found that the project would have a potentially significant impact on noise without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR that are applicable to the proposed project. As shown in Appendix J, C1, C2, and C3 are not applicable. Mitigation Measure C4 would apply to the project. Mitigation Measure C4 restricts construction activities to the hours of 8:00 a.m. and 5:00 p.m. Monday through Saturday, and on Sundays and holidays from 10 a.m. to 6 p.m. This mitigation is more stringent than the City of Pleasanton Municipal Code Section 9.04.100, which allows construction between the hours of 8:00 a.m. and 8:00 p.m. daily, except Sunday and holidays when construction should be limited to the hours of 10:00 a.m. and 6:00 p.m. The more stringent mitigation applied to the Happy Valley Specific Plan will also apply to the Spotorno Ranch Project. In addition, this mitigation measure, applied to the HVSP in relation to noise, will be carried forward as a Condition of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed. In addition, The Bypass Road would not be constructed as part of the project. The reduction in units and elimination of the Bypass Road would result in less ground disturbance and construction traffic trips (short-term noise) as well as less stationary operational and roadway noise (long-term noise) than what was originally analyzed in the HVSP FEIR which would lessen the noise impacts of the project as a whole. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to noise. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.10.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate.

### Noise Levels in Excess of Standards

| | |
|---|---|
| **Impact NOI-1:** | **The project would not generate or expose persons to noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.** |

#### *Impact Analysis*

*Short-term Construction Impacts*

A significant impact would occur if construction noise levels at the proposed project site would exceed the standards established by the Pleasanton Municipal Code Section 9.04.100. According to Section 9.04.100, noise producing construction activities shall not be permitted on Sundays or on holidays unless authorized by a valid city permit. Furthermore, the City's criteria for construction noise establishes that construction, alteration or repair activities shall be allowed between the hours of 8:00 a.m. and 8:00 p.m., daily, if the activities meet at least one of the following noise limitations: no individual piece of equipment shall produce a noise level exceeding 83 dBA at a distance of 25 feet or the noise level at any point outside of the property plane of the project shall not exceed 86 dBA.

Noise impacts from construction activities associated with the project would be a function of the noise generated by construction equipment, equipment location, sensitivity, of nearby land uses, and the timing and duration of the construction activities.

Two types of short-term noise impacts would occur during site preparation and project construction. The first type would result from the increase in traffic flow on local streets, associated with the transport of workers, equipment, and materials to and from the project site. The transport of workers and construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the site. Because workers and construction equipment would use existing routes, noise from passing trucks would be similar to existing vehicle-generated noise on these local roadways. For this reason, short-term intermittent noise from trucks would be minor when averaged over a longer time-period and would not be expected to exceed existing peak noise levels in the project vicinity. Therefore, short-term construction-related noise impacts associated with worker and equipment transport to the project site would be less than significant.

The second type of short-term noise impact is related to noise generated during site-preparation, grading, and construction activities. Construction is performed in discrete steps, each of which has 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. Thus, the noise levels vary as construction progresses. Despite the variety in the types and sizes of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction noise ranges to be categorized by work phase. Table 3.10-1 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

The site preparation phase, which includes excavation and grading activities, generates the highest noise levels because the noisiest construction equipment is earthmoving equipment. Earthmoving equipment includes excavating machinery and compacting equipment, such as bulldozers, draglines, backhoes, front loaders, roller 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. 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 proposed project is expected to require the use of scrapers, bulldozers, water trucks, haul trucks, and pickup trucks. Based on the information provided in Table 3.10-1 above, the maximum noise level generated by each scraper is assumed to be 85 dBA $L_{max}$ at 50 feet from this equipment. Each bulldozer would generate 85 dBA $L_{max}$ at 50 feet. The maximum noise level generated by graders is approximately 85 dBA $L_{max}$ at 50 feet. Each doubling of sound sources with equal strength increases the noise level by 3 dBA. Assuming that each piece of construction equipment operates at some distance from the other equipment, a reasonable worst-case combined noise level during this phase of construction would be 90 dBA $L_{max}$ at a distance of 50 feet from the acoustic center of a construction area. This would result in a reasonable worst-case hourly average of 86 dBA $L_{eq}$.

The project site is bordered by single-family residential land uses to the north, northwest, west, and southwest; a golf course, undeveloped land and Westbridge Lane to the south; and open space to the east. The nearest off-site residence is located adjacent to the project site's northwestern corner and is approximately 88 feet from the acoustic center of construction activity where multiple pieces of heavy machinery would operate. At this distance, construction noise levels at the nearest edge of the property plane of the proposed project site would be expected to range up to 85 dBA $L_{max}$, with a worst-case hourly average of 81 dBA $L_{eq}$, intermittently, when multiple pieces of heavy construction equipment operate simultaneously. Noise levels would not exceed 86 dBA at any point outside of the property plane of the project. Therefore, construction noise levels would not exceed the City's standard for construction noise levels.

Although there could be a relatively high single-event noise exposure potential causing an intermittent noise nuisance, the effect on longer-term (hourly or daily) ambient noise levels would be small but could result in annoyance or sleep disturbances at nearby sensitive receptors. As noted in Section 3.10.5, Threshold of Significance, construction hours are governed by Mitigation Measure C.4 of the HVSP FEIR, which restricts construction hours to 8:00 a.m. and 5:00 p.m. Monday through Saturday. Restricting construction activities to these stated time-periods, as well as implementing the best management noise reduction techniques and practices outlined in Mitigation Measure (MM) NOI-1, would ensure that construction noise would not result in sleep disturbances at nearby off-site sensitive receptors or expose persons to noise levels in excess of established standards. Therefore, with implementation of MM NOI-1, the potential short-term construction noise impacts on sensitive receptors in the vicinity of the project site would be reduced to a less than significant level.

*On-site Traffic Noise Impacts*

A significant impact would occur if project residents and employees would be exposed to transportation noise levels in excess of the City's "normally compatible" land use compatibility

standard of 60 dBA $L_{dn}$ for single-family residential land uses or if project residents and employees were exposed to interior noise levels that would exceed the City's interior noise standard of 45 dBA $L_{dn}$.

The FHWA highway traffic noise prediction model (FHWA RD-77-108) was used to evaluate existing and future project-related traffic noise conditions along modeled roadway segments in the vicinity of the project site. The projected future traffic noise levels on roadways adjacent to the site were analyzed to determine compliance with the City's noise and land use compatibility standards. Traffic modeling was performed using the data obtained from the project-specific traffic impact study conducted by Fehr & Peers (March 2018). This traffic impact study provides data for existing (year 2018) and future conditions. The resultant noise levels were weighed and summed over a 24-hour period to determine the $L_{dn}$ values. The traffic noise modeling input and output files—including the 60 dBA, 65 dBA, and 70 dBA $L_{dn}$ noise contour distances—are included in Appendix I. Table 3.10-7 shows a summary of the traffic noise levels for existing (year 2018), near-term, and cumulative conditions, with and without the project as measured at 50 feet from the centerline of the outermost travel lane.

### Table 3.10-7: Existing, Near Term, and Cumulative Modeled Roadway Noise Levels

| Roadway Segment | $L_{dn}$ (dBA) 50 feet from Centerline of Outermost Lane | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Existing + Project | Increase over Existing No Project (dBA) | Near Term | Near Term + Project | Increase over Near Term No Project (dBA) | Cumulative | Cumulative + Project | Increase over Cumulative no Project (dBA) |
| Sunol Boulevard—I-680 off-ramp to Riddell Street | 66.3 | 0.1 | 67.6 | 67.6 | 0.0 | 68.2 | 68.3 | 0.1 |
| Sunol Blvd—Riddell Street to Arlington Drive | 66.3 | 0.0 | 67.6 | 67.6 | 0.0 | 68.3 | 68.3 | 0.0 |
| Sunol Blvd—Arlington Drive to Sycamore Road | 66.2 | 0.0 | 67.2 | 67.2 | 0.0 | 68.0 | 68.0 | 0.0 |
| Sycamore Road—Sunol Blvd. to Sycamore Creek Way | 54.8 | 0.5 | 55.6 | 56.0 | 0.4 | 56.1 | 56.4 | 0.3 |
| Sycamore Road—Sycamore Creek Way to Amber Lane | 51.5 | 0.8 | 51.8 | 52.4 | 0.6 | 53.1 | 53.5 | 0.4 |
| Happy Valley Road—West of Alisal Street | 48.0 | 1.6 | 49.4 | 50.0 | 0.6 | 50.3 | 51.1 | 0.8 |
| Alisal Street—Happy Valley Road to Faith Chapel Assembly of God | 43.1 | 1.2 | 45.0 | 45.1 | 0.1 | 45.9 | 46.3 | 0.4 |
| Source: FirstCarbon Solutions 2017. | | | | | | | | |

As shown in Table 3.10-7, projected traffic noise levels along Alisal Street near the southern boundary of the project site would range up to 46.3 dBA $L_{dn}$ as measured at 50 feet from the centerline of the nearest travel lane under cumulative plus project conditions.

The nearest proposed structure to the Alisal Street segment is the proposed home on lot #39 on the site. The façade of this building would be located approximately 100 feet from the centerline of Alisal Street. At this distance, traffic noise levels from Alisal Street would range up to approximately 41.3 dBA $L_{dn}$. These noise levels are within the City's "Normally Acceptable" range of up to 60 dBA $L_{dn}$ for new single-family residential land use developments. Therefore, implementation of the proposed project would not expose persons to traffic noise levels in excess of acceptable standards.

Traffic noise impacts to off-site receptors are discussed under Impact NOI-3. However, it can be noted that the projected traffic noise levels along Alisal Street would range up to 46.3 dBA $L_{dn}$ as measured at 50 feet from the centerline of the nearest travel lane under cumulative plus project conditions. These noise levels are well below the City's "Normally Acceptable" range of up to 60 dBA $L_{dn}$ for new single-family residential land use developments.

*Stationary Operational Noise Impacts*

A significant impact would occur if the project would result in operational noise levels in excess of 60 dBA as measured at any point outside of the property plane.

Project-related stationary noise sources would include new mechanical ventilation equipment. Typical new residential mechanical ventilation systems (such as exterior air conditioning units) generate noise levels up to approximately 60 dBA $L_{eq}$ at a distance of 25 feet. The closest off-site residential receptor is located directly adjacent to the project site's northwestern corner and approximately 70 feet from where the potentially closest new mechanical equipment could be located. At this distance, these noise levels would attenuate to below 51 dBA $L_{eq}$ at the nearest noise sensitive receptor. These on-site stationary operational noise levels would not exceed the City's noise performance threshold of 60 dBA. Therefore, on-site stationary source noise impacts would be less than significant.

### *Level of Significance Before Mitigation*

*Short-term impacts*

Potentially significant impact.

*Long-term impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term impacts*

**MM NOI-1** In addition to requiring that all project developers comply with the applicable construction noise exposure criteria established within the City's Municipal Code 9.04.100, the City shall require developers on the potential sites for rezoning to implement construction best management practices to reduce construction noise, including:

- The construction contractor shall ensure that all equipment driven by internal combustion engines shall be equipped with mufflers, which are in good condition and appropriate for the equipment.
- The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.
- The construction contractor shall utilize "quiet" models of air compressors and other stationary noise sources where technology exists.
- At all times during project grading and construction, the construction contractor shall ensure that stationary noise-generating equipment shall be located as far as practicable from sensitive receptors and placed so that emitted noise is directed away from adjacent residences.
- The construction contractor shall ensure that the construction staging areas shall be located to create the greatest feasible distance between the staging area and noise-sensitive receptors nearest the project site.
- The construction contractor shall ensure that all on-site construction activities, including deliveries and engine warm-up, shall be restricted to the hours of 8:00 a.m. to 8:00 p.m. daily, except Sunday and holidays, when the exemption shall apply between 10:00 a.m. and 6:00 p.m., construction, alteration or repair activities.

*Long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term impacts*

Less than significant impact.

*Long-term impacts*

Less than significant impact.

## Groundborne Vibration Impacts

| | |
|---|---|
| **Impact NOI-2:** | **The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels.** |

### *Impact Analysis*

This section analyzes both construction and operational groundborne vibration impacts. The City of Pleasanton has not adopted criteria for groundborne vibration impacts. Therefore, for purposes of this analysis, the FTA's vibration impact criteria are utilized. The FTA has established industry accepted standards for vibration impact criteria and impact assessment. These guidelines are published in its Transit Noise and Vibration Impact Assessment document (FTA 2006), and are summarized in Table 3.10-5 in the regulatory section above.

*Short-term Construction Vibration Impacts to Off-site Receptors*

Construction activity can result in varying degrees of ground vibration, depending on the equipment used on the site. Operation of construction equipment causes ground vibrations that spread

through the ground and diminish in strength with distance. Buildings in the vicinity of a construction site respond to these vibrations with varying results ranging from no perceptible effects at the low levels, to slight damage at the highest levels. As shown in the Environmental Setting section above, Table 3.10-2 provides approximate vibration levels for particular construction activities.

Of the variety of equipment used during construction, the vibratory rollers that would be used in the site preparation phase of construction would produce the greatest groundborne vibration levels. Impact equipment such as pile drivers is not expected to be used during construction of this project. Large vibratory rollers produce groundborne vibration levels ranging up to 0.210 inch per second (in/sec) peak particle velocity (PPV) at 25 feet from the operating equipment.

The nearest off-site receptor is a residential home located approximately 70 feet from the construction footprint of proposed structures where heavy equipment would be operating. At this distance, operation of the large vibratory rollers could result in groundborne vibration levels up to 0.045 PPV. This is well below the FTA's damage threshold criteria of 0.12 PPV for even the most fragile structures. Therefore, the impact of short-term groundborne vibration associated with construction to off-site receptors would be less than significant.

*Operational Vibration Impacts*

Implementation of the project would not include any permanent sources of vibration that would expose persons in the project vicinity to groundborne vibration levels that could be perceptible without instruments at any existing sensitive land use in the vicinity of the project site. In addition, there are no existing significant permanent sources of groundborne vibration in the vicinity of the site to which the proposed project would be exposed. The project site is located more than 4,000 feet from the closest lane on Interstate 680. This distance is sufficient to attenuate any vibration from transportation sources to levels that would not be perceptible without instruments within the site. Therefore, project operational groundborne vibration level impacts would be considered less than significant.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

## Substantial Permanent Increase Impacts

**Impact NOI-3: The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.**

### *Impact Analysis*

Significant noise impacts to off-site receptors would occur if the project would result in a substantial increase in ambient noise levels, compared with noise levels existing without the project. A change of 3 dB is the lowest change that can be perceptible to the human ear in outdoor environments, while a change of 5 dBA is considered the minimum readily perceptible change to the human ear in outdoor environments. Therefore, for purposes of this analysis, an increase of 5 dBA or greater in ambient noise levels is considered a substantial increase.

*Traffic Noise Impacts*

The highest traffic noise level increase with implementation of the project would occur along Happy Valley Road between Alisal Street and Unnamed Road, under existing plus project conditions. Along this roadway segment, the project would result in an increase of 1.6 dBA under plus project conditions compared to conditions that would exist without the project. This increase is well below a 5 dBA increase that would be considered substantial. Therefore, the impact would be less than significant.

*Stationary Noise Source Impacts to Off-site Receptors*

The project would include new stationary noise sources such as mechanical ventilation system equipment.

Based on the analysis shown in the Impact NOI-1 discussion above, the average noise levels generated by mechanical ventilation system equipment operations would attenuate to approximately 51 dBA $L_{eq}$ at the nearest off-site residential receptor. Based on the noise monitoring results shown in Table 3.10-3, daytime ambient noise levels in the vicinity of the nearest off-site receptor were documented to be 50.9 dBA $L_{eq}$, with measured maximum noise levels of up to 65.9 dBA $L_{max}$. Therefore, these operational noise levels would not exceed existing ambient noise levels at the nearest off-site receptor by 5 dBA or greater. Therefore, as project-related operational noise levels would not result in a substantial (5 dBA or greater) increase in ambient noise levels at any off-site sensitive receptor, project-related mechanical equipment operational noise impacts to off-site receptors would be less than significant.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

## Substantial Temporary Increase Impacts

| | |
|---|---|
| **Impact NOI-4:** | **The project would not result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.** |

### *Impact Analysis*

A significant impact would occur if the project would result in substantial temporary or periodic increases in ambient noise levels above the Municipal Code Section 9.04.100 or outside of accepted construction hours.

Construction noise impacts were previously analyzed in the Impact NOI-1 discussion. As shown in this discussion, the nearest edge of the property plane for the proposed project site would be approximately 88 feet from the acoustic center of construction activity where multiple pieces of heavy machinery would operate. At this distance, construction noise levels would be expected to range up to 85 dBA $L_{max}$, with a worst-case hourly average of 81 dBA $L_{eq}$, intermittently, when multiple pieces of heavy construction equipment operate simultaneously at the nearest center of construction activity.

Although there would be a relatively high single-event noise exposure potential causing intermittent noise nuisance, the effect on longer-term (hourly or daily) ambient noise levels would be small. The project would be required to comply with Municipal Code requirements, including the permissible hours of construction. Therefore, compliance with the City's permissible hours of construction as well as implementation of Mitigation Measure NOI-1, which outlines standard construction noise reduction measures, would ensure that construction noise would not result in a substantial temporary increase in ambient noise levels and would be considered a less than significant impact.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

Less than significant impact.

## Airport Noise Impacts

| | |
|---|---|
| **Impact NOI-5:** | **The project would not be 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.** |

### *Impact Analysis*

The nearest public airport to the project site is the Livermore Municipal Airport, located approximately 4.5 miles northeast of the project site. Because of the distance from and orientation of the airport runways, the project site is located well outside of the 65-dBA CNEL airport noise contours. Therefore, implementation of the project would not expose persons residing or working in the project site to noise levels from airport activity that would be in excess of normally acceptable standards for residential land use development. Therefore, no impact would occur.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

No impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

No impact.

## Private Airstrip Noise Impacts

| | |
|---|---|
| **Impact NOI-6:** | **The project would not be located within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels.** |

### *Impact Analysis*

There are no private airstrips within 2 miles of the project site. Therefore, no impact would occur.

### *Level of Significance Before Mitigation*

*Short-term and long-term impacts*

No impact.

### *Mitigation Measures*

*Short-term and long-term impacts*

No mitigation is necessary.

### *Level of Significance After Mitigation*

*Short-term and long-term impacts*

No impact.

# 3.11 - Public Services

## 3.11.1 - Introduction

This section describes the existing public services setting and potential effects from the implementation of the Specific Plan within the Plan Area and its surroundings. Descriptions and analysis in this section are based on information provided by the City of Pleasanton General Plan, the Pleasanton Unified School District (PUSD), the California Department of Education, and the East Bay Regional Parks District. Additional information was provided through correspondence with the Livermore-Pleasanton Fire Department and the Pleasanton Police Department (Appendix H).

## 3.11.2 - Environmental Setting

### Fire Protection and Emergency Medical Services

The Livermore-Pleasanton Fire Department (Fire Department) provides fire protection and emergency medical services (EMS) to a 55-square-mile area encompassing the City of Livermore and the City of Pleasanton, Pleasanton Ridge, Lawrence Livermore National Laboratory, and unincorporated areas of Alameda County including Castlewood and Happy Valley. The Fire Department is headquartered at Station No. 1, located at 3560 Nevada Street in Pleasanton.

#### *Stations*

The Fire Department maintains 10 stations, one headquarters, and one training center. The fire headquarters, the training center and five of the stations are located in Pleasanton, fielding an on-duty force of 18 personnel per day. The remaining five fire stations are located in Livermore. Station No. 1 at 3560 Nevada Street (1.88 miles north of the project site), Station No. 4 at 1600 Oak Vista Parkway (1.89 miles northwest of the project site), and Station No. 5 at 1200 Machado Place (2.65 miles northeast of the project site) are the three fire stations closest to the Plan Area.

#### *Apparatus*

The Fire Department operates a total of 52 vehicles, including 10 fire prevention vehicles, 12 Type I fire engines, three Type III vehicles, eight Type VI vehicles, two ladder trucks, and seven utility vehicles such as rescue vehicles and a volunteer van.[1]

#### *Staffing*

According the Pleasanton General Plan, the Fire District employs 117 full-time personnel, 24 reserve personnel, and 36 volunteer personnel. All firefighters are trained Emergency Medical Technicians and State Certified Firefighters I and II with specialized defibrillator training. A total of 53 personnel are advanced life support paramedics. As of 2013, the Fire District had 0.68 sworn firefighter per 1,000 residents within its service area.

#### *Response Times and Protocols*

The majority of the City lies within a 5-minute travel time from one of the five fire stations. The City requires developments located outside the 5-minute travel time or located in Special Fire Protection

[1] City of Pleasanton General Plan, Public Services, "Fire Hazard Protection," pgs 5–15, July 2009

Areas, such as the Specific Plan Area, to provide additional fire mitigation measures, which include, at a minimum, automatic fire sprinkler systems.[2]

The Fire District's goal is an overall response time of 7 minutes, 90 percent of the time. When the first units for a structure fire are dispatched from one of the staffed emergency response companies, the three closest engines, a ladder truck, and the shift Battalion Chief are automatically assigned. In addition, a private sector medic ambulance can be dispatched in the event one of the occupants of the structure or Fire District personnel needs medical assistance at the scene.[3]

In 2017, the Fire District responded to 14,443 calls for assistance. According to the Pleasanton General Plan, the Fire District's median response time for urban areas is 5 minutes and 6 seconds, with arrival on the scene of an emergency incident within 7 minutes from the time of dispatch over 90 percent of the time. These response times exclude dispatch and turnout times, and indicate that the City is currently operating in compliance with the stated goal for overall response time.

### *Mutual Aid*

The Fire Department is responsible for fire protection and suppression for all areas within the city limits, in addition to providing contractual services in a number of developed areas outside the city limits, including Happy Valley, the Remen Tract, and the Castlewood Country Club. For larger structure and wildland fires, the Fire Department participates in the Alameda County and statewide fire mutual aid agreements, which provide for additional fire suppression services, personnel, and support equipment. The Department provides Fire and EMS services to the Veterans Hospital—Livermore by contract.

### *ISO Rating*

The Insurance Services Office (ISO) Public Protection Classification Program currently rates the Fire District a 3 on a scale of 1 to 10 for urban areas, of which 1 is the highest possible protection rating and 10 is the lowest. The ISO rating measures individual fire protection agencies against a Fire Suppression Rating Schedule, which includes such criteria as facilities and support for handling and dispatching fire alarms, first-alarm response and initial attack, and adequacy of local water supply for fire-suppression purposes. The ISO ratings are used to establish fire insurance premiums. Only 5 percent of the more than 44,000 fire agencies in the United States received an ISO 2 rating or higher.

### *Emergency Medical Response*

Of the 5,814 emergency responses undertaken in Pleasanton by the Fire Department in 2017, 3,912 responses (or 67 percent) were calls for medical attention. The Fire Department is the primary first responder to these calls. All fire station companies include a State-licensed paramedic (who is also a captain, engineer, or firefighter) on every shift, while all firefighters are trained as Emergency Medical Technicians and paramedics. Field personnel can provide medical interventions for both adult and pediatric patients suffering from a multitude of conditions ranging from medical conditions to

[2] City of Pleasanton General Plan DEIR, Public Services, "Fire Protection and Emergency Response Services," pg 3.4-1, September 2008.

[3] City of Pleasanton 2005 General Plan 2025 DEIR, Public Services, "Fire Protection and Emergency Response Services," pg 3.4-1, September 2008.

traumatic injuries. One ambulance, operated by American Medical Response, is located in Pleasanton on Francisco Street.

## Police Protection

The Pleasanton Police Department (Police Department) provides police protection within the Pleasanton city limits.

### *Police Facilities*

The Police Department is currently headquartered at 4833 Bernal Avenue, Pleasanton, approximately 1.6 miles from the Plan Area. The Chief of Police oversees the entire Police Department. The Police Department contains an Operations Division and Investigation and Services Division, each managed by one Police Captain. The Operations Division not only patrols the City, but it also includes a traffic enforcement unit, a canine unit, SWAT, and special events. The Investigations and Services Division includes professional standards unit, criminal investigations unit, youth and community services unit, and support services covering dispatch and records. The Investigations and Support Services Division is responsible for the following activities and support functions: Criminal Investigations, Property/Evidence, Crime Analysis, School Resource Officers, Crime Prevention, Personnel & Training, Professional Standards, Fleet maintenance, and Dispatch and Records management.

### *Police Activity*

The Police Department responded to more than 72,432 calls for service in 2017. Table 3.11-1 provides a summary of police activities for 2013 through 2017.

**Table 3.11-1: Police Activity Summary (2013–2017)**

| Calls for Service | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Citizens Initiated | 34,755 | 36,020 | 37,044 | 38,542 | 40,121 |
| Officer Initiated | 26,614 | 29,806 | 25,650 | 26,605 | 32,311 |
| **Total** | **61,369** | **65,826** | **62,694** | **65,147** | **72,432** |
| Source: Pleasanton Police Department, 2018. | | | | | |

### *Response Times*

The average response time for non-emergencies in 2017 was 23 minutes and 24 seconds, compared with 25 minutes and 11 seconds in 2016. The average response time for emergency calls in both 2017 and 2016 was 3 minutes and 53 seconds. General Plan Policy 27 of the Public Safety Element sets the goal of an average police response time of 4 minutes for emergency calls and 16 minutes for general service calls, indicating that the City does not currently meet the operational goal for average response time to general service calls, but it does meet the goal for emergency service calls.

## Schools

The Pleasanton Unified School District (School District) provides K–12 education to the City of Pleasanton. The School District serves approximately 14,864 students in nine elementary schools, three middle schools, two comprehensive high schools, and one continuation high school.

Table 3.11-2 summarizes the three schools that currently serve the Plan Area, based on most recent information provided by the Pleasanton Unified School District and California Department of Education.

**Table 3.11-2: School Enrollment (2017–2018)**

| School | Grades | Enrollment |
|---|---|---|
| Hearst Elementary | K–5 | 675 |
| Pleasanton Middle School | 6–8 | 1,238 |
| Foothill High School | 9–12 | 2,176 |
| Sources: Pleasanton Unified School District, 2018; California Department of Education, 2018. | | |

## Library Services

The Pleasanton Library is located at 400 Old Bernal Avenue in Pleasanton. The Pleasanton Library opened in 1988 as part of the Alameda County Library system and became a city library in 1999. The library totals 30,000 square feet, including 160,000 catalogued books, CDs, books on tape, eBooks, DVDs, and other items. The Pleasanton Public Library Space Needs Assessment (2004) report documented the need for approximately 72,800 square feet of space to meet the long-term library service needs of the Pleasanton Community and a per capita rate of 3.7 volumes.[4]

## Parks

The City of Pleasanton maintains over 335 developed acres of parkland and 827 acres of open space and offers 44 community and neighborhood parks and approximately 24 miles of trails. Undeveloped open space consists of the 237-acre Augustin Bernal Park, Callippe Preserve Open Space, Bonde Ranch Open Space, and Gold Creek Open Space. General Plan Program 10.18 of the Public Facilities and Community Programs Element establishes the standard of 5 acres of neighborhood or community parks per 1,000 residents. The City of Pleasanton currently provides about 5.1 acres of improved neighborhood and community parks per 1,000 residents.5

Existing park facilities near the Plan Area are summarized below.

[4] City of Pleasanton 2005 General Plan 2025, Public Facilities and Community Programs, "Library Facilities and Programs," p. 6–4, July 2009.
[5] City of Pleasanton 2005 General Plan 2025, Public Facilities and Community Programs, "Parks and Recreation," p. 6–5, July 2009.

### *Callippe Preserve Golf Course*

The Callippe Preserve Golf Course is located at 8500 Clubhouse Drive, approximately 0.19 mile south of the project site. The golf course includes clubhouse, a restaurant and a shop.[6]

### *Centennial Park*

Centennial Park is located at 5353 Sunol Boulevard, approximately 0.98 mile northeast of the project site, and is considered a Community Park. The 5.7-acre park includes amenities such as barbeque pits, bocce ball courts, a dog park, an exercise course, horseshoes, picnic tables, and public art.

### *Mission Hills Park*

Mission Hills Park is located at 600 Junipero Street, approximately 0.60 mile north of the project site, and is considered a Neighborhood Park. The 8.5-acre park includes amenities such as barbeque pits, basketball courts, picnic tables, a tot play area, and a youth play area.

### *Pleasanton Upper Playfields*

Pleasanton Upper Playfields located at 4645 Bernal Avenue, approximately 0.96 mile north of the project site, and is considered a Neighborhood Park. The 3-acre park includes amenities such as a baseball field, picnic tables, soccer fields, a tot play area, and a youth play area.

### *Community Facilities*

The Operations Services Department is responsible for the operations and maintenance of the City's infrastructure and administers many quality of life services, such as:

- Callippe Preserve Golf Course
- Environmental services
- Graffiti removal
- Tree maintenance and removal permitting
- Street maintenance
- Streetlights
- Street sweeping
- Traffic control systems
- Park & trail maintenance
- Public landscaping
- Water distribution
- Sewer collection
- Storm drainage systems
- Utility billing
- Weed abatement
- Maintenance services to city buildings
- Fleet procurement and maintenance of city vehicles
- Recycled Water Program
- Water Conservation Program.[7]

## 3.11.3 - Regulatory Framework

### State and Regional

### *California Fire Code and California Building Code*

The International Fire Code and the International Building Code, established by the International Code Council (ICC) and amended by the State of California, prescribe performance characteristics and materials to be used to achieve acceptable levels of fire protection.

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[6] Ptownlife.org, "All Parks." Website: http://www.ptownlife.org/parks/. Accessed May 23, 2018.
[7] City of Pleasanton, "Operation Services." Website: http://admin.cityofpleasantonca.gov/gov/depts/os/default.asp. Accessed February 10, 2017.

### *Leroy F. Greene School Facilities Act of 1998*

The California State Legislature enacted the Leroy F. Green School Facilities Act of 1998 (Senate Bill 50), which made significant amendments to existing state law governing school fees. Senate Bill 50 prohibited state or local agencies from imposing school impact mitigation fees, dedications, or other requirements in excess of those provided in the statute. The legislation also prohibited local agencies from using the inadequacy of school facilities as a basis for denying or conditioning approvals of any project.

### *East Bay Regional Park District Master Plan*

The EBRPD Master Plan is the District's official guide for planning its future facilities. It was originally adopted in 1973 and is periodically updated to reflect changing circumstances, with the most recent update adopted in 2013. The Master Plan is intended to maintain a balance between the need to protect and conserve natural resources with the need for recreational use of parklands. It also contains a "Master Plan Map" that graphically illustrates the District's existing and planned open space areas, parks and trails.

## Local

### *City of Pleasanton*

*General Plan*

The City of Pleasanton General Plan sets forth the following goals, policies, and programs that are relevant to public services:

**Public Safety Element**

- **Goal 3:** Minimize the risks to lives, property, and the environment due to fire hazards within the Planning Area, and provide the highest quality of emergency response service feasible.
- **Policy 8:** Provide an adequate level of fire and emergency medical equipment and personnel to protect the community.
  - **Program 8.2:** Require new development to pay for fire safety improvement needs generated by the new development.
- **Policy 9:** Strive to enhance emergency medical response in Pleasanton.
- **Policy 10:** Strive to respond to all emergency fire-related calls within seven minutes of the time the call for service is received 90 percent of the time.
  - **Program 10.1:** Deny proposed developments not within a five-minute travel time of a Fire Station unless acceptable mitigations are provided.
  - **Program 10.2:** Develop a system of fire hazard mitigations based on the probability of occurrence and number of people at risk.
- **Policy 11:** Maintain or improve the City's existing Insurance Services Office fire-protection rating of three.
  - **Program 11.1:** Require developers to finance and construct necessary water facilities for their projects when they develop.
  - **Program 11.2:** Require that all new developments be provided with sufficient fire-flow facilities at the time of development at least at the level specified by the Fire Chief.

- **Policy 13:** Require fire mitigation measures in new and existing developments that reduce the fire threat to the structure and occupants. Require development outside the five-minute travel time and in Special Fire Protection Areas to provide effective fire prevention measures.
  - **Program 13.1:** Require the installation of building and fire code compliant fire-detection and alarm equipment in residential and commercial structures.
  - **Program 13.2:** Install automatic fire sprinkler protection in certain structures as required by adopted City ordinances.
  - **Program 13.3:** Encourage the installation of automatic fire-sprinkler systems in all new construction.
  - **Program 13.4:** Provide adequate fire-equipment access to all structures in the city.
  - **Program 13.5:** Partner with the California Department of Forestry and Fire Prevention and Firewise Communities to identify measures that reduce the fire threat in Special Fire Protection Areas.
- **Goal 8:** Provide the highest quality of Police services within the city.
- **Policy 26:** Work in collaboration with the community to provide the highest level of Police services, making Pleasanton a safer place to live, work and play.
  - **Program 26.2:** Require new development to pay for police safety improvements required of that development.
- **Policy 27:** Strive for a response time of an average of four minutes for emergency calls, and sixteen minutes for general service calls.
- **Policy 29:** Seek ways to reduce police service demands through the contemporary practice of "Crime Prevention Through Environmental Design."
  - **Program 29.1:** Incorporate crime reduction and public safety response features in the design and planning of private and public development.
  - **Program 29.2:** Submit all discretionary use permits to the Police Department for analysis of, and recommendations to reduce, impacts on police services.
- **Goal 4:** Promote lifelong learning.
- **Policy 7:** Encourage and support high quality public and private educational facilities in Pleasanton and facilitate lifelong educational opportunities for all ages.
  - **Program 7.1:** Work with the School District to locate school sites to preserve the quality of life of existing and new neighborhoods.
- **Goal 5:** Enhance the quality of Pleasanton library services.
- **Policy 9:** Provide sufficient sites and improvements for a full range of library facilities to serve existing and future development.
- **Goal 6:** Achieve a complete park and recreation system featuring a wide variety of opportunities to serve the public need.
- **Policy 10:** Provide sufficient parkland and recreational activities to accommodate existing and future needs of residents, workers, and visitors.
  - **Program 10.1:** Acquire all park lands shown on the General Plan Map and retain them for permanent public open space through the City's Park Dedication Ordinance and other means.
  - **Program 10.2:** Encourage developers to dedicate public park acreage in areas designated for park use on the General Plan Map rather than contribute in-lieu fees.
  - **Program 10.3:** Disperse neighborhood and community parks throughout the city and combine them with areas of natural, scenic, or cultural resources.

- **Program 10.4:** Provide a wide variety of active and passive recreational facilities to accommodate the needs of all ages in a diverse and inclusive community. Conduct periodic public surveys to ascertain the park and recreational needs of the community.
- **Program 10.5:** Develop neighborhood, community, and regional parks in accordance with the General Plan goals and the land use diagram.
- **Program 10.6:** Provide additional lighted facilities in appropriate park locations to accommodate the community's nighttime recreational needs. Potential new sites include the Bernal Property, Staples Ranch Community Park or another community park.
- **Program 10.7:** Provide community parks with adequate parking facilities to the greatest extent possible.
- **Program 10.8:** Locate parks within one-half mile of the residential area they serve. To the greatest extent possible, such parks should not be separated from the neighborhood they serve by major arterials, commercial centers, and topographical or other features which create a direct or perceived physical barrier to the park.
- **Program 10.13:** Encourage the establishment of recreational opportunities for business park employees in conjunction with the development of business parks.
- **Program 10.14:** Continue to support non-traditional sports which serve the public need and investigate opportunities to provide facilities for them (non-traditional sports might include skateboarding, roller-blading, rock-climbing, BMX, racquetball, sports facilities for the disabled, etc.).
- **Program 10.15:** Explore the construction of additional indoor recreation facilities.
- **Program 10.18:** Maintain at least the standard of 5 acres of neighborhood or community parks per 1,000 people.
- **Program 10.19:** Design Community Parks to better integrate active recreation, leisure recreation, and open space in ways that will be more functional for all three uses.
- **Program 10.20:** Design sports fields in ways that will maximize flexibility and that will allow sports fields to evolve over time to meet the changing sports needs of the community.
- **Program 10.22:** Provide trails, bike routes or pedestrian walkways to connect the parks and recreational facilities throughout Pleasanton.

## 3.11.4 - Methodology

FirstCarbon Solutions evaluated potential impacts on public services through review of the General Plan and after consultation with the Livermore-Pleasanton Fire Department and the Pleasanton Police Department.

## 3.11.5 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, public services and utilities impacts resulting from the implementation of the proposed project would be considered significant if the project would:

> . . . result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental 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?
b) Police protection?
c) Schools?
d) Parks?
e) Other public facilities?

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to public services. The HVSP FEIR found that the project would result in less than significant impacts in relation to police services and recreation and parks and did not require mitigation measures. The FEIR found that the project would have a potentially significant impact on fire protection.

Appendix J provides a list of mitigation measures from the HVSP FEIR. As shown in Appendix J, Mitigation Measure O2 is not applicable to the proposed project and O1 is applicable. This mitigation measure, applied to the HVSP in relation to public services, will be carried forward as a Condition of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the public services impacts of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation and envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to public services. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.11.6 - Project Impacts and Mitigation Measures

### Fire Protection

| | |
|---|---|
| **Impact PS-1:** | **The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection.** |

#### *Impact Analysis*

The proposed project is located within the adopted Happy Valley Specific Plan (HVSP) area. The HVSP included the development of a maximum of 183 new residences within its planning boundaries, and the construction of a “Bypass Road,” linking Westbridge Lane with Sycamore Creek Way. Water, sewer, and other utility systems were extended into the HVSP area to provide residents with connections to

the City's system; however, many residences still utilize wells and septic systems. Other public services (such as police and fire), were given jurisdictional authority of the HVSP as well.

Three of five fire stations within the City of Pleasanton are located within a 5-mile radius of the project site: Station No. 1 at 3560 Nevada Street (1.88 miles north of the project site), Station No. 4 at 1600 Oak Vista Parkway (1.89 miles northwest of the project site), and Station No.5 at 1200 Machado Place (2.65 miles northeast of the project site). As illustrated on General Plan Figure 5-6, the project is located within an area that contracts with the City for fire protection.

The risk of structural fire would be low, as all structural improvements would be required to comply with the standards contained in the current California Fire and Building Codes requiring modern construction methods and flame retardant building materials.

General Plan Program 10.1 indicates that proposed developments not within a 5-minute travel time of a fire station should be denied unless acceptable mitigations are provided, and Program 10.2 requires that a system of fire hazard mitigations be developed based on the probability of occurrence and the number of people at risk. The project is not within a 5-minute response time of a fire station; however, as described below, the Fire Department verified that they would be able to serve the project site with existing Fire Department facilities.

The Fire Department would review the proposed project to ensure that all new improvements meet state and local Building and Fire Code requirements. During this review, additional design measures potentially needed to compensate for travel time beyond five minutes would be required of the project in accordance with General Plan Policy 10, Program 10.1 and 10.2. Further, once operational, projects would be subject to the Fire Department's inspection program, which would ensure compliance with applicable state and local standards, including requirements for emergency access.

On February 1, 2018 FCS staff contacted the Chief Torres of the Fire Department by email to get the Department's input on the proposed project's potential impacts to fire protection services. The Fire Department indicated that, although the proposed project would increase demand for Fire Department Services, the level of the increase would not result in the construction of new or the expansion of existing Fire Department facilities. Therefore, impacts associated with Fire Department facilities would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Police Protection

| | |
|---|---|
| **Impact PS-2:** | **The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection.** |

### *Impact Analysis*

New land uses developed within the Plan Area would increase demand for police services. The proposed project is within 2 miles of Police Department's headquarters on Bernal Avenue. On February 1, 2018, FCS staff contacted Chief Spiller of the Pleasanton Police Department by email to get the Department's input on the proposed project's potential impacts to police protection services. The Police Department indicated that, although the proposed project would result in an increase in demand for police services, the level of increase would not result in a need for the construction of new or the expansion of existing Police Department facilities.

Program 26.2 of the General Plan requires that new development pay for police safety improvements required of that development. In addition, General Plan Program 29.1 requires that crime reduction and public safety response features are incorporated into the design and planning of private and public developments. Program 29.2 requires that all discretionary use permits are submitted to the Police Department for analysis and recommendations to reduce impacts on police services. Development of the proposed project would be required to implement these General Plan Programs.

Development of the proposed project would increase the need for police services. Additional staffing would be required to ensure adequate response times are needed. The need for additional police staffing is outside the scope of this Subsequent EIR, since it does not involve physical impacts on the environment. Rather, this impact is most appropriately addressed through other mechanisms such as Conditions of Approval, Development Agreements, or other means.

In summary, the proposed project would not result in a need for new or expanded police protection facilities that have the potential to result in physical impacts on the environment. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Schools

**Impact PS-3:** **The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools.**

### *Impact Analysis*

The project would develop 39 single-family residences that would have the potential to directly contribute to an increase in enrollment at Pleasanton Unified School District (PUSD).

According to the PUSD, student generation rates for future residential development are 0.247 for grades K–5, 0.109 for grades 6–8, and 0.090 for grades 9–12. Based on these student yield factors, the project's 39 new single-family residences are expected to generate approximately 18 total new students (10 elementary students, 4 middle school students, and 4 high school students).

The project alone is unlikely to result in a need for new or expanded school district facilities; however, when coupled with other residential development projects and population growth within the project area, the project could incrementally contribute to the need for additional school district resources. The PUSD's school board indicated recently that several schools will be at or over capacity based on the most recent demographic projections, which may result in the need for new or upgraded facilities and additional personnel.[8] The PUSD collects mandatory school facility fees on new development projects in accordance with Senate Bill 50 and related state laws. The collection of fees offsets the cost associated with construction or expansion of school facilities, obtaining equipment, and the hiring and training of additional personnel. Senate Bill 50 provides that developer fees shall be the exclusive means of considering and mitigating impacts on school facilities that occur or might occur as a result of approval of the development of real property. As part of the project entitlement process, the applicant will be responsible for paying its share of school facility fees. As such, with the payment of the mandatory school facility fees, impacts associated with the construction or expansion of school district facilities would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

[8] Testa, Julie. 2017. School Overcrowding Today in Future, 9/12/17 Meeting. Website: https://www.pleasantonweekly.com/square/2017/09/10/school-overcrowding-today-and-in-future-91217-meeting. Accessed June 1, 2018.

## Parks

| | |
|---|---|
| **Impact PS-4:** | **The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks.** |

### *Impact Analysis*

The California Department of Parks and Recreation, EBRPD, and City of Pleasanton provide various parks, trails, and community facilities for public use throughout the City. City park standards are established in the City's 2025 General Plan. Specifically, Program 10.18 of the General Plan aims to achieve a level of park facilities equal to 5 acres per 1,000 population or 0.005 acre per person. As noted above, the City currently provides approximately 5.1 acres of improved neighborhood and community parks per 1,000 residents. The City maintains 40 community and neighborhood parks, approximately 24 miles of trails, and over 800 acres of undeveloped open space. Based on projected population growth and subsequent buildout, the General Plan estimates the ratio of park facilities to population to increase to 0.008 acre per person or 5.8 acres per 1,000 population.

The 39 single-family residential units would be expected to result in a population increase of approximately 117 people (at 3 persons per household). The project would develop 31 acres (20.13 percent of the entire site), while 80 acres, would be dedicated for the preservation of agricultural open space. The future development of planned parks within the City, coupled with 80 acres of agricultural open space preservation, would not affect the City's ability to maintain its parkland ratio. As a result, the project would not result in the need for construction of new or expanded existing park facilities. The project would make a significant contribution to the development of on-site open space for use by the residents of the project. As such, impacts associated with the construction or expansion of park and recreational facilities would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Other Public Facilities

**Impact PS-5:** **The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities.**

### *Impact Analysis*

The City of Pleasanton provides public library services to its residents. The Pleasanton Library encompasses 30,000 square feet. The General Plan includes the Pleasanton Public Library Space Needs Assessment (2004) report which documented the need for approximately 72,800 square feet of space to meet the long-term library service needs of its residents.

The project has the potential to generate 117 new residents to the City, a nominal increase when compared with the existing population of 67,600 that was evaluated in the General Plan as being served by the City's library system. As noted above, the project would follow provisions of both the HVSP and the City's General Plan. As a result, the project's generation of approximately 117 new residents would not affect the City's ability to meet its library space standard. Thus, the project would not result in the construction of new or expanded library branches. Therefore, impacts associated with other public facilities such as public libraries would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# 3.12 - Transportation and Traffic

## 3.12.1 - Introduction

This section describes the existing transportation setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information contained in the Spotorno Property Transportation Assessment, prepared by Fehr & Peers and included in this SEIR as Appendix I.

## 3.12.2 - Existing Conditions

This chapter describes the existing transportation conditions in the study area, including the roadway network and transit, pedestrian, and bicycle facilities in the vicinity of the project site.

### Roadway System

The project area is located on the east side of Interstate 680 (I-680), with regional access to the site provided from an interchange with I-680 at Sunol Boulevard. Local access is provided by Sycamore Road, Happy Valley Road, and Alisal Street. These roadways, as well as other key roadways in the study area, are described below.

#### *Interstate 680*

I-680 is a north/south designated scenic highway that connects San Jose to I-80 near Fairfield. I-680 is located west of the project site and is accessible to the project via the Sunol Boulevard interchange. Three travel lanes per direction are provided through Pleasanton and based on Caltrans data, the facility carries approximately 125,000 to 130,000 vehicles per day in the vicinity of Sunol Boulevard. I-680 is designated as a Truck Route in the *City of Pleasanton 2005–2025 General Plan*.

#### *Sunol Boulevard*

Sunol Boulevard is a southwest-northeast arterial that provides access to residential collector and local streets within the study area. Sunol Boulevard provides one travel lane in each direction through the I-680 interchange, three travel lanes in each direction east of the I-680 interchange and two travel lanes in each direction between Sycamore Road and Bernal Avenue. The posted speed limit on the section east of I-680 is 40 miles per hour (MPH). West of I-680, Sunol Boulevard continues as Pleasanton Sunol Road. No on-street parking is permitted on Sunol Boulevard. Collector roadways that connect to Sunol Boulevard in the study area include Sycamore Road and Happy Valley Road. Local streets that connect with Sunol Boulevard include Riddell Street, Arlington Drive, and Diamond Court.

#### *Sycamore Road*

Sycamore Road is a two-lane, east-west residential collector that connects Sunol Boulevard to Sycamore Creek Way. Class II bicycle lanes are provided along Sycamore Road between Sunol Boulevard and Sycamore Creek Way, and sidewalks are provided on the north side of this segment of roadway. Sycamore Road southeast of Sycamore Creek Way does not provide pedestrian or bicycle

facilities. On-street parking is permitted on some portions of the roadway and the posted speed limit is 25 mph. Speed humps have been installed at several locations along Sycamore Road.

### *Sycamore Creek Way*

Sycamore Creek Way is a two-lane, east-west residential collector that connects to Sycamore Road. Class II bicycle lanes and sidewalks are provided along its length and on-street parking is prohibited. This roadway is planned to be extended to connect with the bypass road as part of the Happy Valley Specific Plan.

### *Arlington Drive*

Arlington Drive is a two-lane, north-south local street that connects Sunol Boulevard to other residential cul-de-sacs, and provides a connection to Happy Valley Road via Carriage Drive to the south. Sidewalks are provided on both sides of the street and on-street parking is permitted. The posted speed limit is 25 mph.

### *Riddell Street*

Riddell Street is a two-lane, north-south local street that connects Sunol Boulevard to residential cul-de-sacs and ends at Happy Valley Road. On-street parking is allowed, and the speed limit is 25 mph. To avoid congestion at the I-680 ramps, Riddell Street is commonly used as a cut-through route to access the I-680 interchange from the west side where vehicle queues are shorter. Posted turn restrictions prohibit the southbound left-turn from Sunol Boulevard to Riddell Street from 6:00 a.m. to 9:00 a.m.

### *Happy Valley Road*

Happy Valley Road is an east-west residential collector roadway that begins at Pleasanton Sunol Road and ends at the intersection of Alisal Street at Westbridge Lane. No pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not provided. The posted speed limit is 30 mph. Approximately 200-feet west of Pleasanton Sunol Road, a railroad undercrossing reduces the travel-way to approximately 18 feet in width. Portions of Happy Valley Road, including the portion at the railroad undercrossing, are under the jurisdiction of Alameda County.

### *Westbridge Lane*

Westbridge Lane is an east-west, two-lane local roadway that provides access to the Callippe Preserve Golf Course. Limited pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not allowed. As currently proposed, the project would construct a new roadway (Clubhouse Drive) that would connect Alisal Street to Westbridge Lane in combination with a cul-de-sac on Westbridge Lane east of Sanctuary Lane. Except for the two existing houses located at 1340 and 1380 Happy Valley Road, existing traffic on Westbridge Lane east of Sanctuary Lane would be rerouted through the project site to Alisal Street. Under analysis of the bypass Road, Westbridge Lane is assumed to become a cul-de-sac, forcing all existing traffic on Westbridge Lane east of Sanctuary Lane (including golf course traffic) to use the road through the project site that would connect to Sycamore Creek Way.

### *Alisal Street*

Alisal Street is a north-south residential collector that connects Sycamore Road with Happy Valley Road. As currently proposed, all access to the project site would occur from a connection to Alisal Street. No pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not provided. The posted speed limit is 25 mph.

### *Study Locations and Analysis Scenarios*

Project impacts on the study area roadway facilities were identified by measuring the effect that project traffic would have on intersections in the site vicinity during the morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak periods when commute traffic is typically the highest. The study intersections were selected in consultation with City staff based on a review of the project location and the amount of traffic that could be added to the intersections in the vicinity of the site. These intersections are shown on Exhibit 3.12-1, which depicts the local roadway system including the following study intersections:

1. Sunol Boulevard at Sycamore Road
2. Sunol Boulevard at Arlington Drive
3. Sunol Boulevard at Riddell Street
4. Sunol Boulevard at Interstate 680 Northbound Ramps
5. Sunol Boulevard at Interstate 680 Southbound Ramps
6. Sycamore Creek Way at Sycamore Road
7. Pleasanton Sunol Road at Happy Valley Road
8. Happy Valley Road at Alisal Street

In addition to the evaluation of peak-hour intersection operations, daily roadway segment operations were evaluated for the following segments:

a) Happy Valley Road, east of Pleasanton Sunol Road
b) Riddell Street, south of Sunol Boulevard
c) Arlington Drive, south of Sunol Boulevard
d) Sycamore Creek Way, southeast of Sunol Boulevard
e) Sycamore Road, east of Sycamore Creek Way
f) Sycamore Creek Way, west of Summit Creek Lane
g) Alisal Street, south of Sycamore Road
h) Alisal Street, north of Happy Valley Road
i) Happy Valley Road, west of Alisal Street
j) Westbridge Lane, east of Alisal Street
k) Sycamore Creek Way, east of Summit Creek Lane

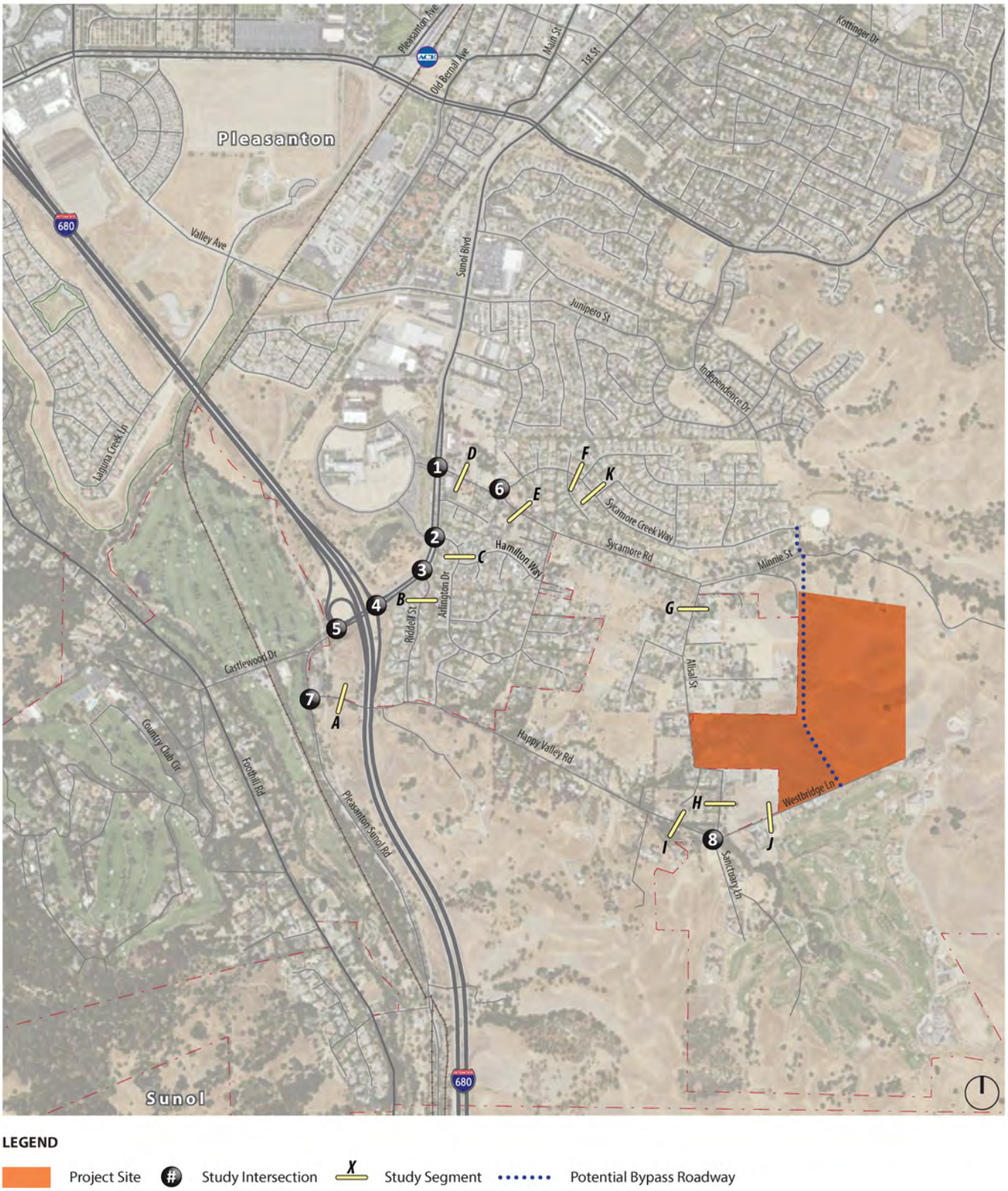
*Scenarios*

Operations of the intersections above were evaluated for the following scenarios using the Transportation Research Board's (TRB) 2000 *Highway Capacity Manual* methodology using Synchro analysis software.

- Scenario 1: Existing—Based on traffic counts collected in 2017.
- Scenario 2: Existing Plus Project without Bypass Road—Existing volumes obtained from traffic counts plus traffic estimated for the Project. Roadway improvements included as part of the project are considered.
- Scenario 3: Existing Plus Project with Bypass Road—Existing volumes obtained from traffic counts plus traffic estimated for the Project. This scenario considers the bypass road and potential traffic shifts associated with the new roadway.
- Scenario 4: Existing Plus Approved Projects (EPAP or Near-term) No Project Conditions—Existing traffic plus traffic that could be generated by approved projects in the area, without development of the proposed project.
- Scenario 5: EPAP Plus Project without Bypass Road—Traffic volumes from Scenario 4 plus traffic estimated for the project. Roadway improvements included as part of the project are considered.
- Scenario 6: EPAP Plus Project with Bypass Road—Traffic volumes from Scenario 4 considering the bypass road and potential traffic shifts associated with the new roadway, plus project traffic.
- Scenario 7: Far-Term (Cumulative) No Project Conditions—Projected traffic volumes and the projected roadway system using the City of Pleasanton Travel Demand Model. The traffic forecasts include approved and pending projects, in addition to build out of land uses consistent with the General Plan and adopted Housing Element, which includes buildout of remaining non-project parcels within the Happy Valley Specific Plan area. This scenario does not include traffic generated by the proposed project.
- Scenario 8: Far-Term (Cumulative) Project Conditions without Bypass Road—Traffic volumes from Scenario 7 plus traffic estimated for the project. Roadway improvements included as part of the project are considered.
- Scenario 9: Far-Term (Cumulative) Project Conditions with Bypass Road—Traffic volumes from Scenario 7 considering the bypass road and potential traffic shifts associated with the new roadway, plus project traffic.

## Level of Service

The operations of roadway facilities are described with the term “level of service” (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., free flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations “at capacity.” When volumes exceed capacity, stop-and-go conditions occur and operations are designated as LOS F. The City of Pleasanton generally strives to maintain LOS D or better for peak-hour intersection operations.




Source: Fehr & Peers, February 2018.

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Exhibit 3.12-1
Project Site Vicinity and Analysis Locations

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A number of intersections, referred to as Gateway and Exempted Downtown intersections, may be allowed to degrade to below the LOS D standard if no reasonable mitigation exists or if the necessary mitigation is contrary to other goals and policies of the City. For example, physical improvements to provide additional capacity for vehicles at Downtown intersections could degrade the pedestrian realm. For Gateway intersections, additional vehicle capacity could encourage additional vehicle traffic that should remain on the regional transportation system and could also degrade the pedestrian experience and visual character of the intersection.

Gateway intersections analyzed in this report include the following intersections:

- Sunol Boulevard at Interstate 680 Northbound Ramps
- Sunol Boulevard at Interstate 680 Southbound Ramps

Different methods are used to assess signalized and unsignalized (stop-controlled) intersections.

### Signalized Intersections

Operations of signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board's 2000 *Highway Capacity Manual,* which uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. Table 3.12-1 summarizes the relationship between average delay per vehicle and LOS for signalized intersections. This method evaluates each intersection in isolation and the effects of vehicle queue spillback are not considered in the analysis results.

**Table 3.12-1: Signalized Intersection LOS Criteria**

| Level of Service | Description | Delay in Seconds |
|---|---|---|
| A | Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay. | < 10.0 |
| B | Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay. | > 10.0 to 20.0 |
| C | Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping. | > 20.0 to 35.0 |
| D | The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity (V/C) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. | > 35.0 to 55.0 |
| E | This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. | > 55.0 to 80.0 |

**Table 3.12-1 (cont.): Signalized Intersection LOS Criteria**

| Level of Service | Description | Delay in Seconds |
|---|---|---|
| F | This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels. | > 80.0 |
| Source: Fehr & Peers, 2018. | | |

## Unsignalized Intersections

Operations at unsignalized intersections were evaluated using the method from Chapter 17 of the 2000 *Highway Capacity Manual*. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. Table 3.12-2 summarizes the relationship between delay and LOS for unsignalized intersections.

**Table 3.12-2: Unsignalized Intersection LOS Criteria**

| Level of Service | Description | Delay in Seconds |
|---|---|---|
| A | Little or no delays | ≤ 10.0 |
| B | Short traffic delays | > 10.0 to 15.0 |
| C | Average traffic delays | > 15.0 to 25.0 |
| D | Long traffic delays | > 25.0 to 35.0 |
| E | Very long traffic delays | > 35.0 to 50.0 |
| F | Extreme traffic delays with intersection capacity exceeded | > 50.0 |
| Source: Fehr & Peers, 2018. | | |

## Existing Traffic Conditions

### *Traffic Counts*

Weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 a.m. to 6:00 p.m.) peak period intersection turning movement counts were conducted at the study intersections in March 2017 on a clear day with area schools in normal session, including separate counts of vehicles, pedestrians and bicyclists. For the study intersections, the single hour with the highest traffic volumes during the count periods was identified. The AM peak hour in the study area is generally from 7:30 a.m. to

8:30 a.m. and the PM peak hour is generally from 5:00 p.m. to 6:00 p.m. The peak-hour volumes are presented on Exhibit 3.12-2 along with the existing lane configuration and traffic control. Traffic count worksheets are provided in Appendix I.

Automatic machine traffic counts were conducted over a 72-hour period (Thursday through Saturday) on clear days in March 2017, while area schools were in session. Counts collected during the school year are representative of typical traffic conditions for the majority of the year. The average daily traffic volumes on these roadways are summarized below in Table 3.12-3 and depicted on Exhibit 3.12-3. Counts collected during the school year are representative of typical traffic conditions for the majority of the year; however, some historic counts collected by the City of Pleasanton indicate that during peak summer days, the golf course can generate more vehicle traffic than captured on the days of data collection.

Traffic volumes on local streets in the area are less than 1,500 vehicles per day and volumes on residential collectors are less than 3,000 vehicles per day, with the exception of Sycamore Road between Sunol Boulevard and Sycamore Creek Way, which carries approximately 3,500 vehicles per day. Weekday traffic volumes are variable, with between a 1 percent and 8 percent difference between the two weekdays of data collection, with Friday traffic volumes typically higher than Thursday. Generally, traffic volumes are lower on Saturdays than weekdays, except for some segments of Alisal Street and Happy Valley Road where Saturday levels of vehicle traffic are slightly higher than weekday levels.

Exhibit 3.12-2 depicts the existing peak-hour intersection volumes and Exhibit 3.12-3 depicts the existing daily roadway segment volumes.

**Table 3.12-3: Existing Daily Traffic Volumes**

| Roadway | Roadway Classification | Average Weekday | | | Saturday | |
|---|---|---|---|---|---|---|
| | | Daily Traffic[1] | Peak Hourly Traffic[2] | Daily Fluctuation[3] | Daily Traffic | Peak Hourly Traffic |
| A. Happy Valley Road, east of Pleasanton Sunol Road | Residential Collector | 860 | 90 | ±4% | 610 | 90 |
| B. Riddell Street, south of Sunol Boulevard | Local Street | 500 | 60 | ±2% | 470 | 50 |
| C. Arlington Drive, south of Sunol Boulevard | Local Street | 1,290 | 110 | ±4% | 1,110 | 110 |
| D. Sycamore Creek Way, southeast of Sunol Boulevard | Residential Collector | 3,470 | 340 | ±5% | 2,940 | 240 |
| E. Sycamore Road, east of Sycamore Creek Way | Residential Collector | 1,470 | 140 | ±6% | 1,270 | 110 |

## Table 3.12-3 (cont.): Existing Daily Traffic Volumes

| Roadway | Roadway Classification | Average Weekday | | | Saturday | |
|---|---|---|---|---|---|---|
| | | Daily Traffic[1] | Peak Hourly Traffic[2] | Daily Fluctuation[3] | Daily Traffic | Peak Hourly Traffic |
| F. Sycamore Creek Way, west of Summit Creek Lane | Residential Collector | 1,480 | 170 | ±7% | 1,330 | 120 |
| G. Alisal Street, south of Sycamore Road | Residential Collector | 1,020 | 110 | ±8% | 880 | 90 |
| H. Alisal Street, north of Happy Valley Road | Residential Collector | 600 | 80 | ±3% | 620 | 100 |
| I. Happy Valley Road, west of Alisal Street | Residential Collector | 540 | 50 | ±1% | 580 | 70 |
| J. Westbridge Lane east of Alisal Street[4] | Local Street | 870 | 100 | ±3 | 850 | 110 |
| K. Sycamore Creek Way, east of Summit Creek Lane | Residential Collector | 870 | 100 | ±8% | 850 | 70 |

Notes:
[1] Average daily two-way traffic measured over two days.
[2] Average peak-hour volume from the two weekdays of data collection, rounded up to the nearest 10.
[3] Percent difference between the two days of data collection.
[4] Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment.
Source: Fehr & Peers, 2018.

### *Intersection Levels of Service*

Existing operations were evaluated using the method described above for the weekday AM and PM peak hours at the study intersections, as summarized in Table 3.12-4. The analysis was based on the volumes, lane configurations, and traffic control shown on Exhibit 3.12-2. Observed peak-hour factors[1] were used at all intersections for the existing analysis, and pedestrian and bicycle activity was considered in the analysis.

As shown, study intersections generally operate at acceptable service levels in accordance with standards set by the City of Pleasanton. During the AM peak hour, all intersections directly adjacent to the site operate at LOS C or better. During the PM peak hour, all intersections directly adjacent to the project site operate at LOS D or better. However, morning peak-hour operation at the Sunol Boulevard/I-680 interchange is worse than presented here due to the effects of freeway congestion

[1] The relationship between the peak 15-minute flow rate and the full hourly volume is given by the peak-hour factor (PHF) as shown in the following equation: PHF=Hourly volume/(4* volume during the peak 15 minutes of flow). The analysis of level of service is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour.

that result in vehicle queue spillback from the southbound on-ramp. Additionally, vehicles waiting to turn left from either the northbound or southbound ramp to Sunol Boulevard can experience poor operations. Detailed intersection LOS calculation worksheets are presented in Appendix I.

**Table 3.12-4: Existing Conditions Peak-hour Intersection Levels of Service**

| Intersection | Control[1] | Peak Hour | Existing Conditions | |
|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 12<br>13 | B<br>B |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 8<br>9 | A<br>A |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (10)<br>0 (14) | A (A)<br>A (B) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 (21)<br>5 **(62)** | A (C)<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | 2 (26)<br>6 **(38)** | A (D)<br>A **(E)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (10) | A (B)<br>A (A) |
| 7. Pleasanton Sunol Road at Happy Valley Road | SSSC | AM<br>PM | 1 (9)<br>2 (9) | A (A)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) |

Notes:
1 Average daily two-way traffic measured over two days.
2 Average peak-hour volume from the two weekdays of data collection, rounded up to the nearest 10.
3 Percent difference between the two days of data collection.
4 Morning peak-hour operation at the Sunol Boulevard/I-680 interchange is worse than presented here, due to the effects of freeway congestion that result in vehicle queue spillback from the southbound on-ramp.
Source: Fehr & Peers, 2018.

## Public Transit

Transit service in the area is provided by Wheels, Pleasanton Paratransit, The County Connection, Bay Area Rapid Transit (BART), and Altamont Commuter Express (ACE).

Wheels provides fixed-route and paratransit service throughout the Cities of Dublin, Pleasanton, and Livermore, and provides connections to other transit service providers. Wheels buses connect major destinations within the Cities of Dublin, Pleasanton, and Livermore, including Downtown areas, employment centers, and destinations such as the Hacienda Business Park, Bernal Corporate Park, Stoneridge Mall, and transit hubs, including BART and ACE stations. Wheels bus schedules are also coordinated with ACE and BART trains during peak commute hours. Route 8 provides the closest service to the project site and operates along Sunol Boulevard and Valley Avenue, approximately 1.5

miles from the site. Route 8 operates between East Dublin/Pleasanton BART and South Pleasanton along Hopyard and Valley, providing a connection to Downtown Pleasanton. It provides service to the Pleasanton Senior Center, Downtown Pleasanton, Kottinger Park, and Vineyard. The Route operates every 30 minutes during peak periods, and every 60 minutes midday and on weekends.

Pleasanton Paratransit provides scheduled door-to-door shared ride services for residents of Pleasanton and Sunol who are age 70 and over, and for disabled residents between the ages of 18 and 69. Transportation is provided between 8:00 a.m. and 5:30 a.m., Monday through Friday, with service also provided on Saturdays. Rides must be requested at least two days in advance.

The Central Contra Costa Transit Authority (CCCTA, County Connection) provides transit service connecting destinations in Contra Costa County to the Tri-Valley area, including service from the East Pleasanton BART station to the San Ramon Transit Center and Bishop Ranch Business Park. There is also a route that connects the Walnut Creek BART station to the Downtown Pleasanton ACE station.

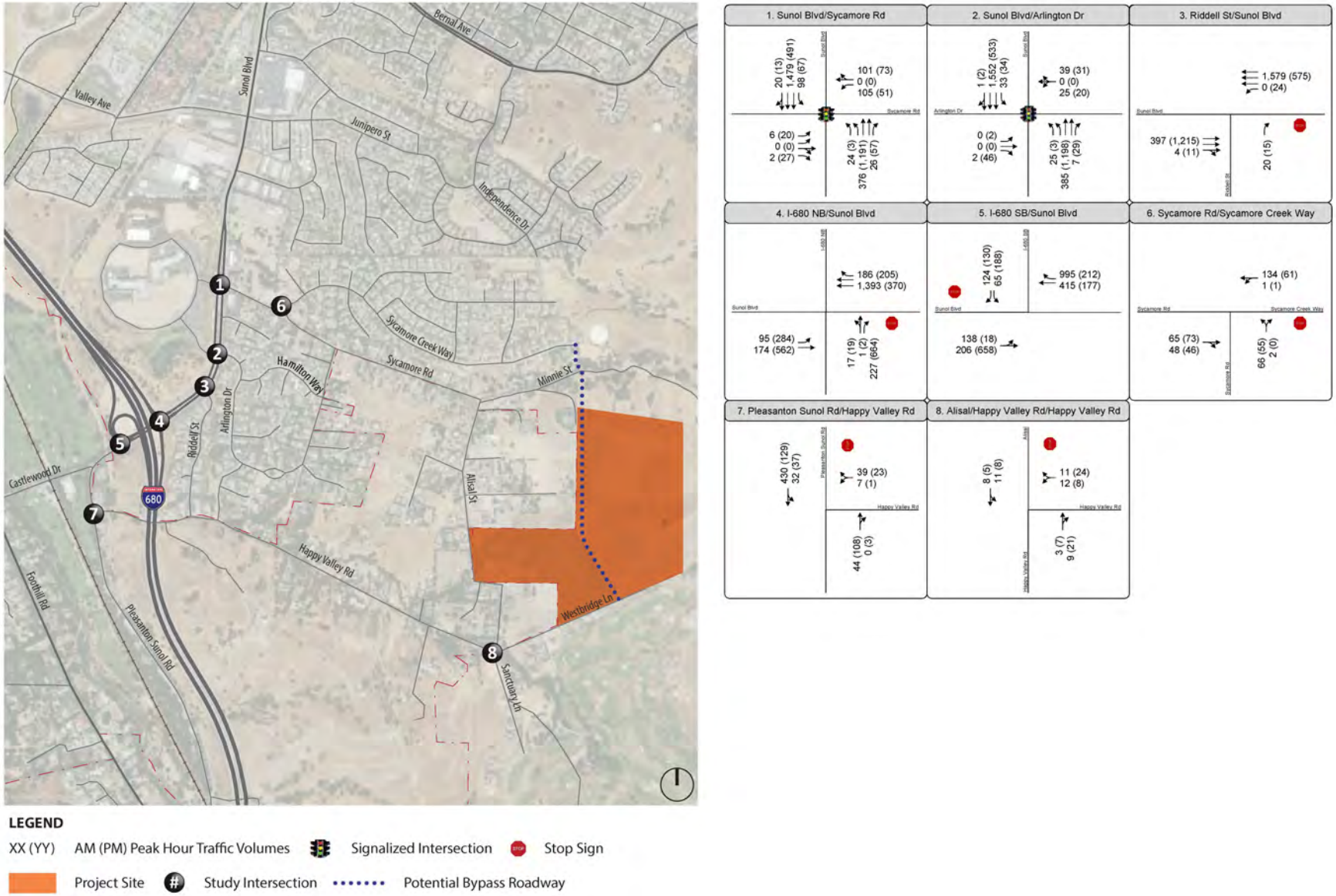
Bay Area Rapid Transit (BART) provides regional transportation connections to much of the Bay Area, and the Dublin/Pleasanton line provides direct access to San Francisco, with several stops in Oakland where connections may be made to other lines. BART train frequency ranges between 15-20 minutes from approximately 5:00 a.m. to 12:00 a.m. Based on 2017 data from BART, approximately 16,000 passengers per day enter and exit the BART system at the East Dublin/Pleasanton station, and approximately 7,000 passengers enter and exit the BART system at the West Dublin/Pleasanton BART Station.

Altamont Commuter Express (ACE) operates weekday train service between Stockton and San Jose with a stop in Downtown Pleasanton. Westbound service is provided from the Central Valley to San Jose during the morning commute period only, while only eastbound service is provided in the afternoon/evening commute period. There are four morning trains through Pleasanton between 5:33 a.m. and 8:18 a.m., and four evening trains between 4:28 p.m. and 7:31 p.m. Travel time from Stockton to Pleasanton is approximately 1 hour and 15 minutes, while travel time from Pleasanton to San Jose is approximately 1 hour. The Pleasanton ACE station is located approximately two miles northwest of the study area on Pleasanton Avenue at Bernal Avenue. Wheels provides shuttle services between the ACE stations and major employment/residential areas in Pleasanton.

Continuous pedestrian connections are not provided to transit stops from the project site, and the closest transit stop is over 1.5 miles from the project site; therefore, it is expected that any future residents who would use transit would drive to transit stations.

## Bicycle Facilities

Bicycle facilities in Pleasanton include the following general types. The graphics following the description of each type of bicycle facility are the minimum American Association of State Highway and Transportation Officials (AASHTO) standards for each type of bike facility, to provide a general depiction of each type of bicycle facility. Within the City of Pleasanton, these standards provide a framework for future implementation, but depending on the circumstances and where feasible, the City of Pleasanton has chosen to go above and beyond AASHTO standards.




Source: Fehr & Peers, February 2018.

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Exhibit 3.12-2
Existing Conditions Peak Hour Traffic Volumes

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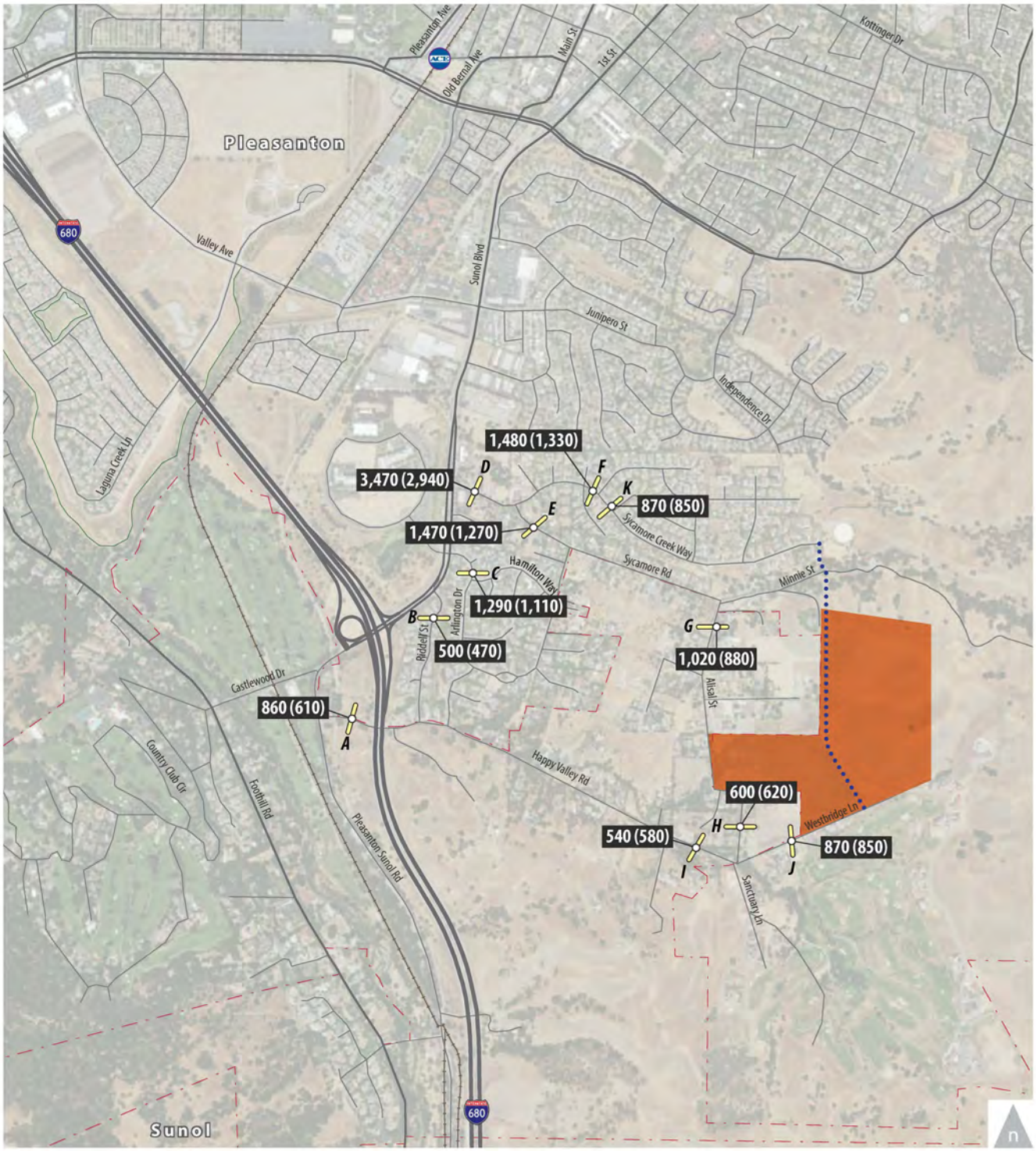


Source: Fehr & Peers, February 2018.

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Exhibit 3.12-3
Existing Daily Roadway Segment Volumes

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- Bike paths (Class I)—Paved trails that are separated from roadways. There are also several unpaved off-street trails within Pleasanton. These facilities are typically shared with pedestrians, although bicycles must yield to pedestrians. Vehicle cross-flow is minimized.
- Cycle Track/Separated Bikeways (Class IV) provides a physically separated lane for increased comfort and protection of cyclists. Can be physically separated by a barrier, such as planters or on-street parking, or grade-separated from the roadway.
- Bike lanes (Class II) provide restricted right-of-way and are designated for the use of bicycles with a striped lane on a street. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted. These facilities may also include a buffer to separate vehicle traffic from bicycle traffic, as well as to separate bicycle traffic from parked vehicles.
- Bike routes (Class III) provide for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.
- Side Paths—An off-street facility located adjacent to a roadway that is shared with pedestrians. These paths may be paved or unpaved.

There are currently Class II bicycle lanes along portions of Sunol Boulevard. In the immediate project vicinity, Class II facilities on Sunol Boulevard are only provided in the southbound direction from Sycamore Road to just west of Arlington Drive, where the lane terminates. Bicycle lanes are also provided in the vicinity of the I-680/Sunol Boulevard interchange. Class II facilities are also provided on Sycamore Road between Sunol Boulevard and Sycamore Creek Way, and along Sycamore Creek Way from Sycamore Road to its terminus. Unpaved trails are also located in the area, including the Callippe Preserve Trail, which has a trail head on Sanctuary Lane at Happy Valley Road and on Clubhouse Drive, northeast of Westbridge Lane.

The 2018 Pedestrian and Bicycle Master Plan identifies the provision of buffered bicycle lanes on Sunol Boulevard from Foothill Road to Bernal Avenue, and a Class I path along the transportation corridor, providing an off-street connection from south of Sunol Boulevard to Downtown Pleasanton.

The 1993 Trails Master Plan identifies two trails within the Spotorno property area, which are further defined in the February 2018 Working Draft of the Pleasanton Trails Master Plan. The Happy Valley Specific Plan identifies two trails within the Spotorno property area, including one that connects Alisal Street to Westbridge Lane and a second that connects Westbridge Lane to Sycamore Creek Way.

### Pedestrians

Pedestrian facilities include sidewalks, pathways, crosswalks, and pedestrian signals. As noted above, sidewalks are limited on most of the existing roadway networks in the study area. Sunol Boulevard provides sidewalks on the east side of the roadway; however, this sidewalk stops at the I-680 Northbound Ramp. At the intersections of Sunol Boulevard with Sycamore Road and Arlington Drive, there are crosswalks with pedestrian call buttons. Pedestrian activity is low in the study area.

Exhibit 3.12-4 depicts the existing bicycle and pedestrian peak-hour volumes.

## 3.12.3 - Regulatory Framework

### State

#### *California Department of Transportation*

The California Department of Transportation (Caltrans) builds, operates, and maintains the state highway system, including the interstate highway system. Caltrans's mission is to improve mobility statewide. The department operates under strategic goals to provide a safe transportation system, optimize throughput and ensure reliable travel times, improve the delivery of state highway projects, provide transportation choices, and improve and enhance the State's investments and resources. Caltrans controls the planning of the state highway system and accessibility to the system. Caltrans establishes LOS goals for highways and works with local and regional agencies to assess impacts and develop funding sources for improvements to the state highway system.

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway facilities (Caltrans 2002); however, Caltrans recognizes that achieving LOS C/LOS D may not always be feasible. A standard of LOS E or better on a peak-hour basis was used as the planning objective for the evaluation of potential impacts of the project on Caltrans facilities, as that is the standard set for Caltrans facilities in the study area by the Alameda County Transportation Commission (CTC). The following criteria were used to evaluate potential impacts to Caltrans facilities:

- If a Caltrans facility (mainline/ramp merge/ramp diverge) is projected to operate at LOS E or better without the project and the project is expected to cause the facility to operate at LOS F, the impact may be considered significant.
- If a Caltrans facility is projected to operate at LOS F without project and the project is expected to increase density, the impact may be considered significant.

### Regional Regulations

#### *Alameda County Transportation Commission*

The Alameda CTC does not have adopted thresholds of significance for Congestion Management Plan (CMP) land use analysis purposes.

#### *Tri-Valley Transportation Council*

The Tri-Valley Transportation Council (TVTC) established Routes of Regional Significance in the 2015 updated Transportation and Action Plan. The nearest routes of regional significance to the project are Interstate 580 and Sunol Boulevard. Impacts to intersections on Routes of Regional Significance as defined by the TVTC would be considered significant if:

- If a signalized intersection is projected to operate within delay ranges associated with less-than-capacity conditions for motor vehicles (i.e., LOS E or better with an average control delay of equal to or less than 80 seconds per vehicle) without the project and the project is expected to cause the facility to operate at [LOS] F;

- If the intersection is already unacceptable operations (i.e., LOS F) under no project conditions, there is no established threshold.
- Intersections in downtown areas and/or specifically exempted by local jurisdictions are exempt from this TVTC standard. Study intersections 1, 2, 3, 4, 5, and 7 would be subject to this exemption.

## Local Regulations

### *General Plan*

The City of Pleasanton General Plan establishes the following guiding and implementing policies associated with transportation that are relevant to the proposed project:

- **Goal 1:** Develop a safe, convenient and uncongested circulation system.
- **Goal 2:** Develop and manage a local and regional street and highway system which accommodates future growth while remaining acceptable levels of service.
  - **Policy 1:** Complete the City's street and highway system in accordance with the General Plan Map, Figures 3-7 and 3-10, and Table 3-8.
    - **Program 1.1:** Require new developments to pay their fair share of planned roadway improvement costs.
    - **Program 1.2:** Update the Traffic Development Fee study consistent with improvements needed to implement the General Plan circulation system.
    - **Program 1.3:** Support the use of assessment districts to equitably spread the cost of new roadways and improvements and to facilitate installation of improvements with development.
    - **Program 1.5:** Preserve rights-of-way needed for local and regional roadway improvements through dedication of land, as adjacent properties develop.
  - **Policy 2:** Phase development and roadway improvements so that levels of service at adjacent major intersection do not exceed LOS D at major intersections outside Downtown and gateway intersections, except as noted below[2]
    - **Program 2.1:** Monitor roadway improvements to determine if levels of service are approaching congestion according to City standards.
    - **Program 2.2:** Require site-specific traffic studies for all major developments which have the potential to cause the level of service at one or more major intersections to exceed LOS D, and require developers to implement the mitigation measures identified in these studies. In general, require development to improve congested intersections adjacent to such development or to pay its pro-rata share of the cost of such improvements, and to pay traffic development fees for use in mitigating traffic impacts in other areas of the city.
    - **Program 2.7:** Require feasible mitigation measures to keep intersections impacted by development to acceptable service levels, in the event that LOS D is exceeded. If there are no feasible mitigation measures and if the intersections are otherwise not exempt from the LOS D standard, withhold development approvals, including building permits, until the intersections exceeding LOS D are at an acceptable level of service.

[2] Major intersections are those intersections of two or more arterials or one arterial and one collector street. Gateway intersections are intersections located at the edges of the city.

- **Policy 3:** Facilitate the free flow of vehicular traffic on major arterials.
- **Policy 4:** In the Downtown, facilitate the flow of traffic and access to Downtown businesses and activities consistent with maintaining a pedestrian-friendly environment.
- **Policy 5:** At gateway intersections, facilitate the flow of traffic and access into and out of the City, consistent with maintaining visual character, landscaping, and pedestrian convenience.
  - **Program 5.1:** Gateway intersections (listed in Table 3-4) are exempted from the citywide LOS D standard (constrained gateway policy) but consideration may be given to improvements at gateway intersections when it is determined that such improvements are necessary and are consistent with maintaining visual character, landscaping, and pedestrian amenities.
- **Policy 6:** Design and regulate city streets to minimize traffic-related impacts on adjacent land uses.
  - **Program 6.1:** Provide setbacks, landscaping, frontage roads, soundwalls, and other methods to protect adjacent land uses from safety, noise, and air quality impacts associated with traffic on arterials and freeways.
  - **Program 6.6:** Discourage residential driveway access directly onto residential collector streets.
- **Policy 7:** Adhere to City design standards for streets in new developments.
  - **Program 7.1:** Incorporate City design standards for arterials, collectors, neighborhood collectors, and local public and private streets as part of the City's review of new developments.
  - **Program 7.2:** Provide more than one access road for emergency vehicle routes to new developments, whenever feasible.
  - **Program 7.3:** Design complete streets serving pedestrians, bicyclists, motorists, and transit riders of all ages and abilities, except where infeasible. Complete streets may include: alternative intersection control where appropriate; requiring bicycle and pedestrian connections from cul-de-sacs to adjacent streets, trails, bicycle paths, and neighborhoods; and incorporating appropriate traffic calming measures.
  - **Program 7.6:** Design new streets and alterations of existing streets to preserve the character and safety of existing residential neighborhoods.
- **Policy 8:** Maximize traffic safety for automobile, transit, bicycle users, and pedestrians.

- **Goal 3:** Protect residential neighborhood quality-of-life and community character from cut-through traffic, speeding, and nonresidential parking.
  - **Policy 11:** Manage arterial and collector traffic to minimize adverse impacts on neighborhoods.
    - **Program 11.2:** Minimize traffic impacts and cut-through traffic in new developments by incorporating traffic-calming elements and other design features.

## 3.12.4 - Methodology

### Project Trip Generation

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the

adjacent streets are typically the highest. Daily estimates were also developed for Saturday. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition) for single-family homes as presented in Table 3.12-5. The project is expected to generate up to 390 weekday and Saturday daily trips including 30 weekday morning peak hour and 40 weekday evening peak-hour trips.

**Table 3.12-5: Project Trip Generation Estimates**

| Use | Size | Saturday Daily | Weekday | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | AM Peak Hour | | | PM Peak Hour | | |
| | | | | In | Out | Total | In | Out | Total |
| Single Family Homes[1] | 39 dwelling units | 390 | 370 | 7 | 22 | 29 | 25 | 14 | 39 |

Notes:
[1] ITE land use category 210—Single-Family Homes (Adj Streets, 7-9A, 4-6P):
Saturday Daily Rate: (T) =10.08 (X); Weekday Daily: (T) = 9.44 (X)
AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%; PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%
Source: Trip Generation Manual (10th Edition), ITE, 2017; Fehr & Peers, 2018.

## Project Trip Distribution and Assignment

Based on the location of the project area, existing traffic patterns, location of complementary land uses, such as residences from which employees and customers may come from/depart to, and a select zone analysis using the City of Pleasanton travel demand model, trip distribution percentages were developed as depicted on Exhibit 3.12-5.

Project trips were assigned to the roadway network based on the general directions of approach and departure shown on Exhibit 3.12-5, but the route that people take to the site could vary. For example, a driver with a destination on I-680 southbound could travel via Happy Valley Lane or via Sycamore Road to the Sunol Boulevard interchange. The resulting project trip assignment and project-related intersection volumes are shown on Exhibit 3.12-6 without the bypass road and Exhibit 3.12-7 with the bypass road.

Under a scenario without the bypass road, the project would provide a connection to Alisal Street and construct a cul-de-sac on Westbridge Lane at Sanctuary Lane. All existing traffic that uses Westbridge Lane east of Sanctuary Lane would be rerouted through the site. Under a scenario with the bypass road, a cul-de-sac would be constructed on Westbridge Lane at Sanctuary Lane and all project access would occur from Westbridge Lane via the bypass road. For the purposes of this analysis, it is assumed that the bypass road would connect Westbridge Lane to Sycamore Creek Way and no westerly connection to Minnie Street would be provided from the bypass road.

## 3.12.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether transportation and traffic impacts are significant environmental effects, the following questions are analyzed and evaluated. 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 relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

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?

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

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

e) Result in inadequate emergency access?

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

In the context of Checklist Questions a) and b), the following criteria were used to identify significant off-site intersection impacts of the proposed project. Off-site intersection impacts could be considered if the project would result in any of the following:

- Deterioration of a signalized intersection from LOS D (or better) to LOS E or LOS F
- At an intersection projected to operate at LOS E or F prior to the addition of project traffic, the project adds 10 or more trips
- Deterioration of a controlled movement at an unsignalized intersection from LOS E or better to LOS F, or at intersections where a controlled movement already operates at LOS F, one of the following:
  - Project traffic results in satisfaction at the peak-hour volume traffic signal warrant;
  - Project traffic increases minor movement delay by more than 30 seconds; or
  - Where the peak-hour volume signal warrant is met without project traffic and delay cannot be measured, project increases traffic by 10 or more vehicles per lane on the controlled approach.
- The project would 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 and highways:

  - Exceed, either individually or cumulatively, an LOS standard established by the Alameda CTC for designated roads or highways; or
  - For a roadway segment of the Metropolitan Transportation System (MTS) network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the V/C ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project.

- The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit, while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on streets in Pleasanton.

In the context of Checklist Question f), the City of Pleasanton 2005-2025 General Plan, 2018 City of Pleasanton Pedestrian and Bicycle Master Plan, the Happy Valley Specific Plan, the 1993 Trails Master Plan, and the April 2018 Public Review Draft of the Pleasanton Trails Master Plan[3] describe related policies necessary to ensure that pedestrian and bicycle facilities are safe and effective for City residents. Using these plans as a guide, significant impacts to these facilities would occur when a project or an element of the project:

- Creates a hazardous condition that currently does not exist for pedestrians and bicyclists, or otherwise interferes with pedestrian accessibility to the site and adjoining areas; or
- Conflicts with an existing or planned pedestrian or bicycle facility;
- Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Pleasanton, including the Complete Street Policy.

In the context of Checklist Question f), a project causes a significant impact to transit facilities and services if an element of the project conflicts with existing or planned transit services. The evaluation of transit facilities shall consider if:

- A project creates demand for public transit services above the capacity which is provided, or planned;
- A project or project-related mitigation disrupts existing transit services or facilities;
- A project or project-related mitigation conflicts with an existing or planned transit facility; or
- A project or project-related mitigation conflicts with transit policies adopted by the City of Pleasanton, Alameda CTC, Wheels (LAVTA), or BART for their respective facilities in the study area.

## Vehicle Miles Traveled

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated California Environmental Quality Act (CEQA) guidelines to include new transportation-related

[3] The April 2018 Working Draft of the Pleasanton Trails Master Plan has not yet been adopted by the City of Pleasanton, but adoption is expected by the time the project is reviewed by the City for approval, and therefore is referenced in this Draft SEIR.

evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016, which incorporated public comments from the August 2014 guidelines. OPR released final proposed Guidelines on November 27, 2017. The final proposed Guidelines include a new Section 15064.3 on VMT analysis and thresholds. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. New Guidelines Section 15064.3 states that they do not take effect until January 1, 2020 unless the lead agency adopts them earlier. Neither the City of Pleasanton nor the Alameda CTC has established any standards or thresholds on VMT. Therefore, the new guidelines have not yet been adopted and are not in effect at this time.

The final guidelines may change based on the comments received during the Natural Resources Agency formal administrative rulemaking process for adoption under the Administrative Procedure Act. Since there are no standards in effect on VMT analysis, a preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed project was prepared for information and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

### Happy Valley Specific Plan Final EIR

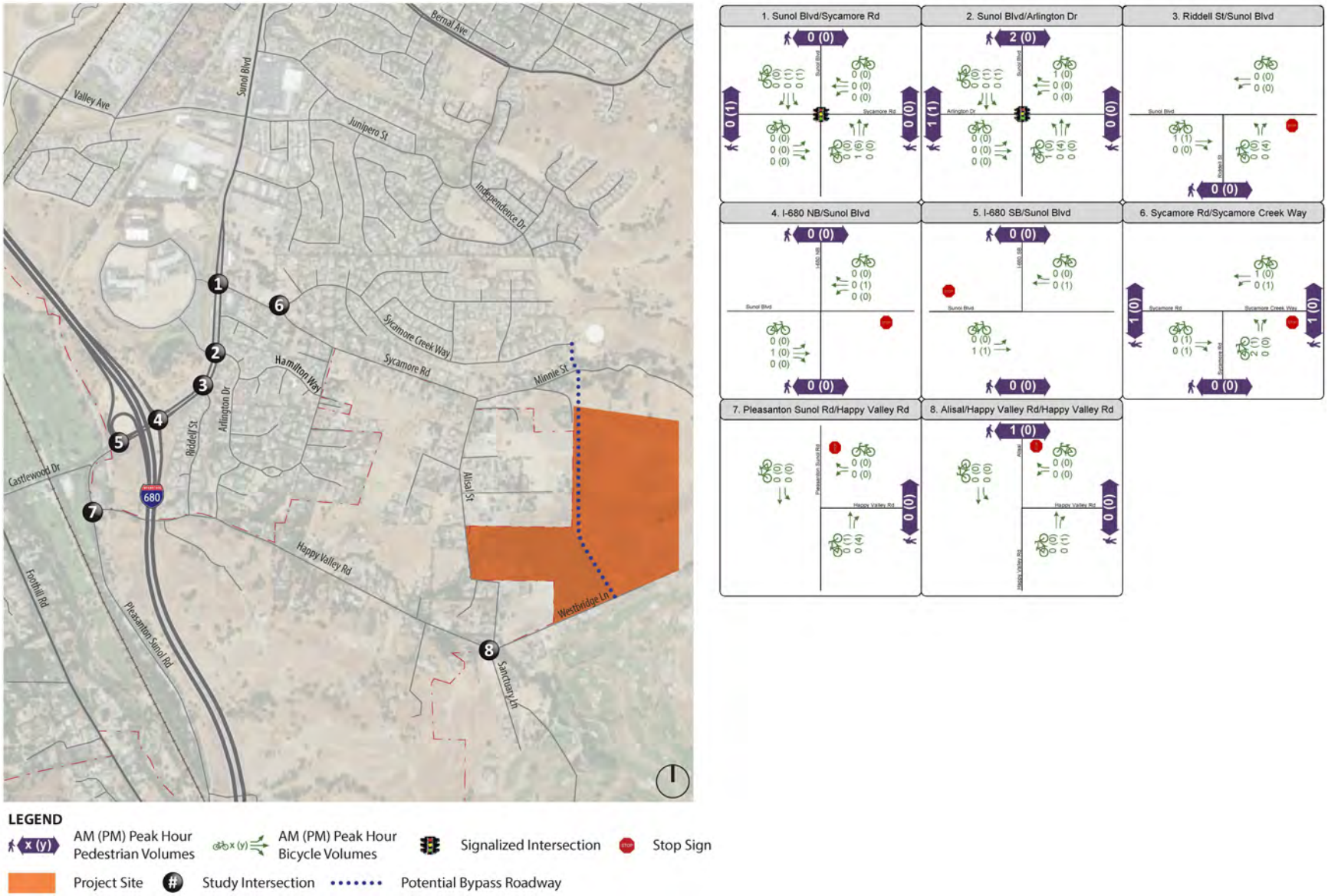
As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to transportation and traffic and found that the project would have a potentially significant impact on transportation and traffic without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR. As shown in Appendix J, Mitigation Measures B1 through B4 and B6 are not applicable to the project and Mitigation Measure B5 would be applicable. This mitigation measure, applicable to the HVSP for transportation and traffic, will be carried forward as a Condition of Approval for the Spotorno Ranch Project.

The project would develop fewer units than what was envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the impacts to transportation and traffic of the project as a whole. The project also proposes the elimination of the Bypass Road. A comparative analysis of the project with and without construction of the Bypass Road is provided in the impact analysis below. As shown, with mitigation, the project would result in a less than significant impact with or without the construction of the Bypass Road. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to transportation and traffic. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.12.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.




Source: Fehr & Peers, February 2018.

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Exhibit 3.12-4
Existing Conditions Peak Hour Bicycle and Pedestrian Volumes

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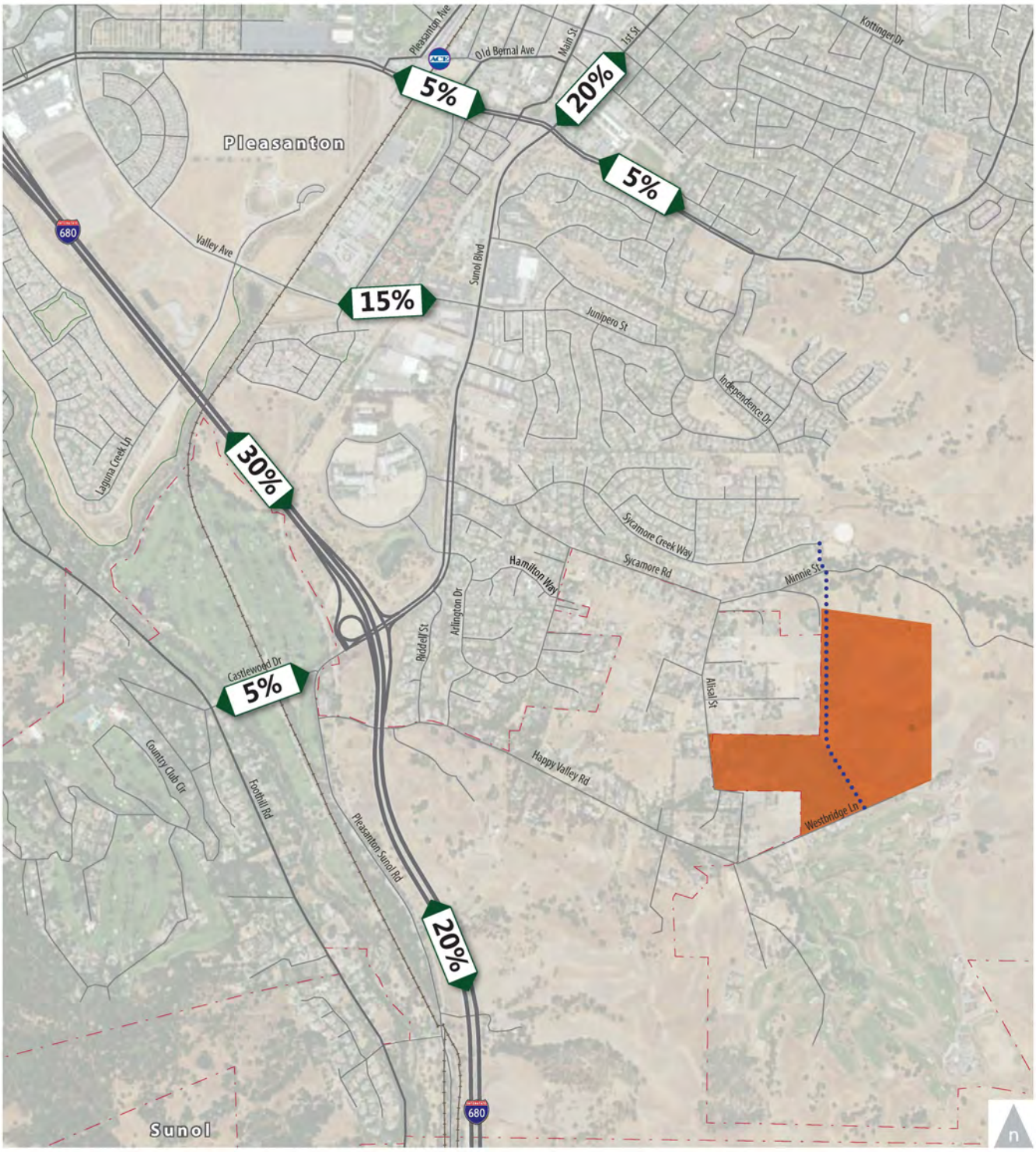


**LEGEND**

Project Site | XX% Project Trip Distribution | Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

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Exhibit 3.12-5
Project Trip Distribution

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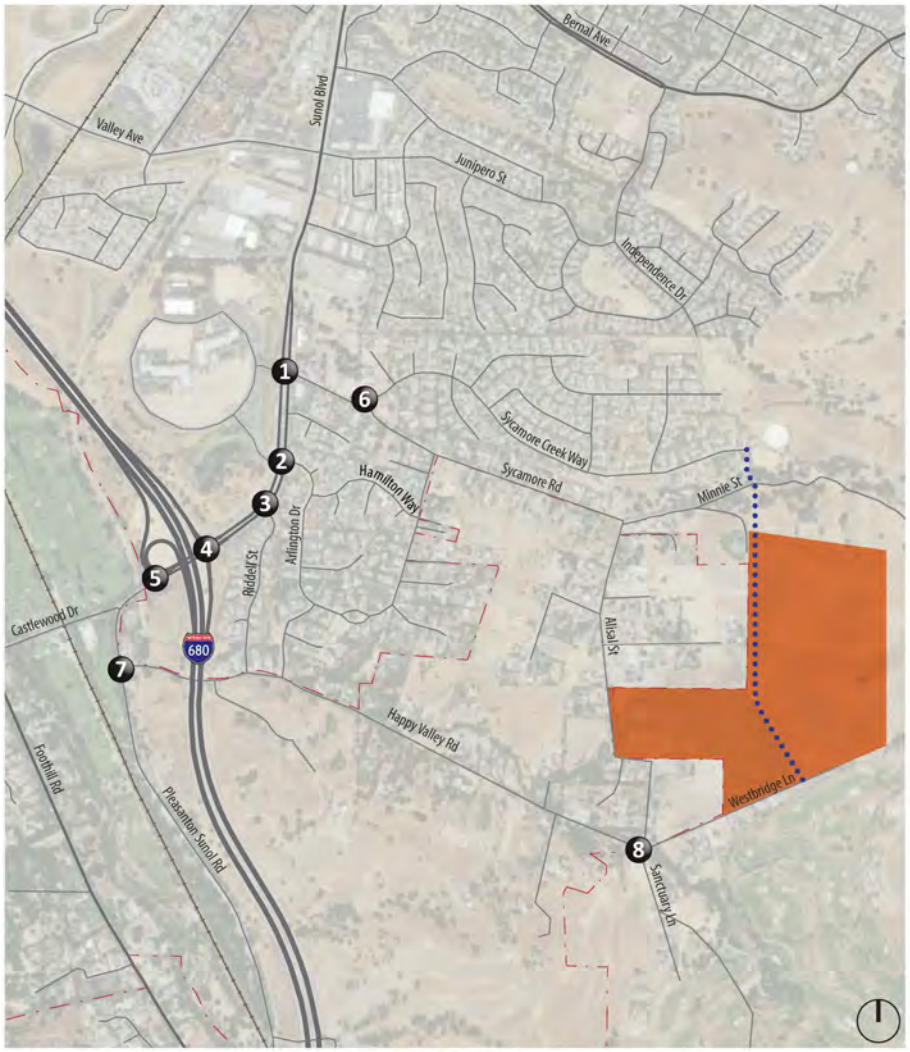


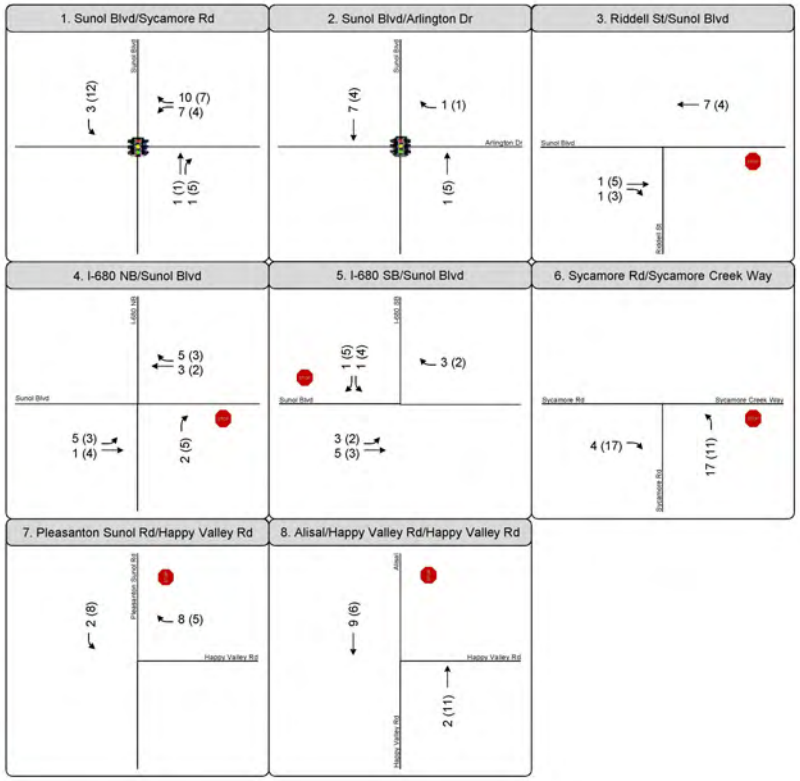


**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

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Exhibit 3.12-6
Project Trip Assignment Without Bypass Road

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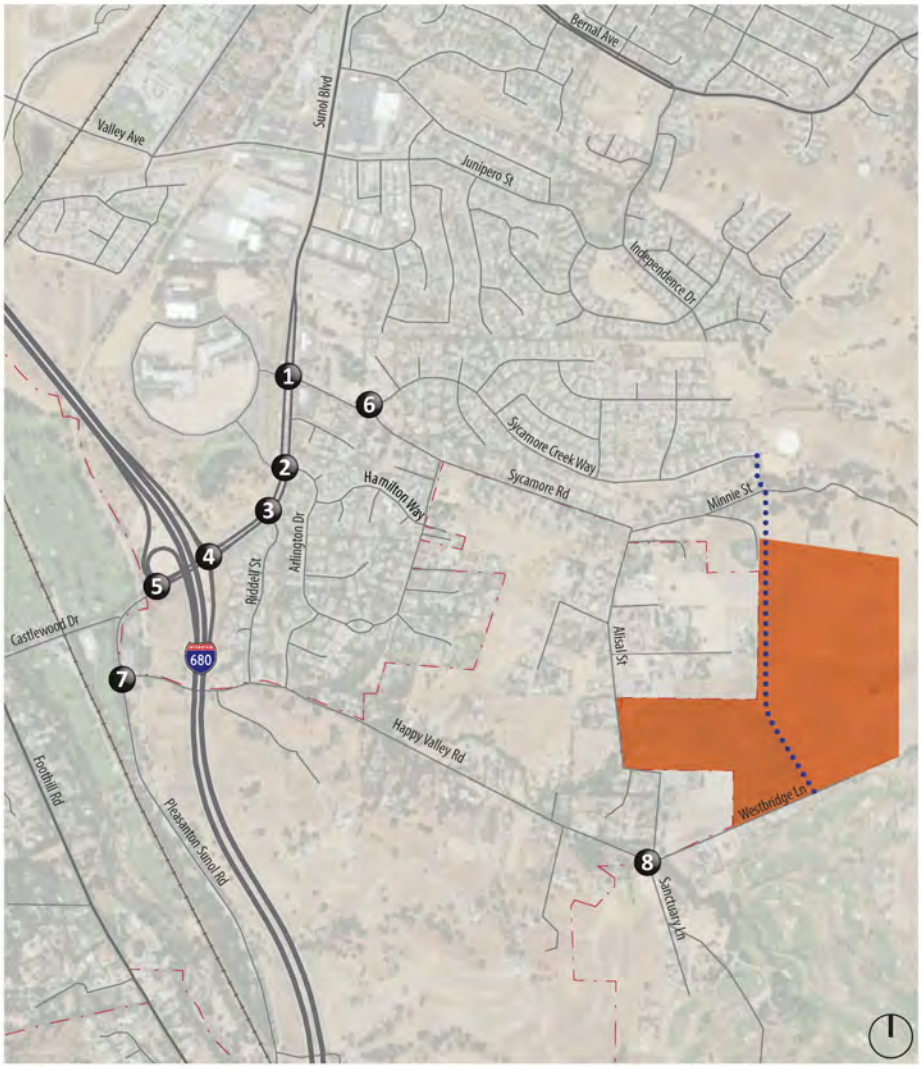


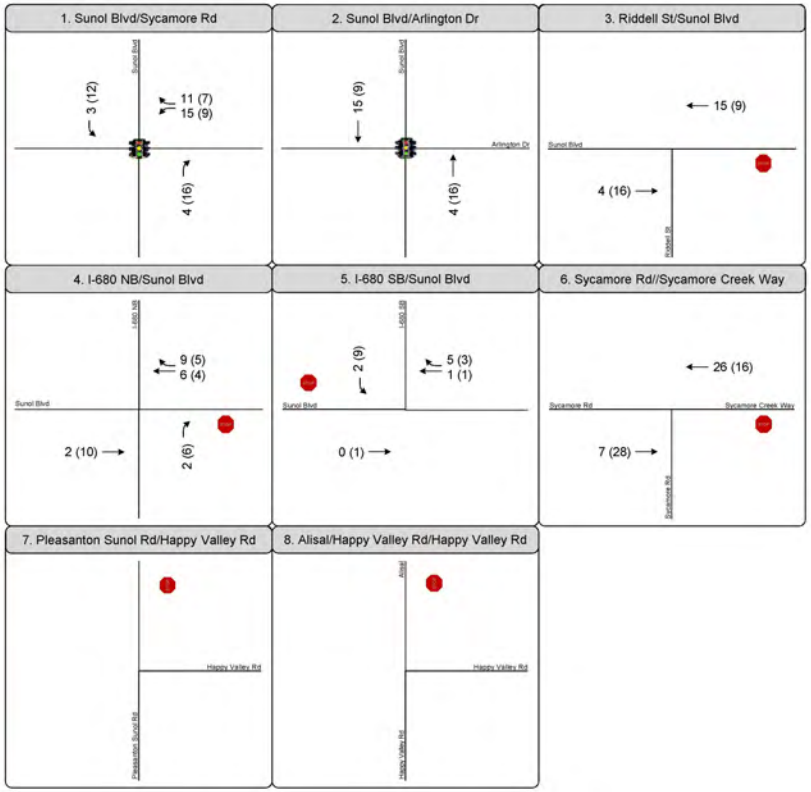


**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

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Exhibit 3.12-7
Project Trip Assignment With Bypass Road

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## Existing With Project Conditions

**Impact TRANS-1: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Existing With Project Conditions.**

### *Impact Analysis*

This section evaluates potential off-site traffic impacts under Existing with Project conditions.

In order to estimate Existing with Project peak-hour intersection turning movement volumes as shown in Exhibit 3.12-8, the project-only volumes (Exhibit 3.12-6) were added to the existing peak-hour traffic volumes (Exhibit 3.12-2). The project would connect to Alisal Street and would close Westbridge Lane at Sanctuary Lane into a cul-de-sac, rerouting all existing traffic that currently travels on Westbridge Lane east of Sanctuary Lane through the project site.

Under a scenario with the bypass road, it was assumed that a cul-de-sac would be constructed on Westbridge Lane at Sanctuary Lane and no access would be provided to Alisal Street. The bypass road would connect Westbridge Lane to Sycamore Creek Way; no westerly connection to Minnie Street would be provided. Existing traffic that currently travels on Westbridge Lane west of Sanctuary Lane would be rerouted to the bypass road, connecting to Sycamore Creek Way, and then to Sycamore Road. This would result in a reduction in vehicle traffic on Happy Valley Road, Alisal Street, and Sycamore Road, east of Sycamore Creek Way, and an increase in vehicle traffic on Sycamore Creek Way, and Sycamore Road between Sycamore Creek Way and portions of Sunol Boulevard. Traffic volumes are projected to decrease slightly on Arlington Drive and Riddell Street. The resulting peak-hour traffic volumes are presented on Exhibit 3.12-9, which considers shifts of existing traffic plus estimates of project traffic under the bypass road scenario.

*Intersection Levels of Service*

Existing with Project without Bypass Road and Existing with Project with Bypass Road conditions were evaluated using the same methods described in Appendix I. The analysis results are presented in Table 3.12-6, based on the traffic volumes and lane configurations previously presented on Exhibit 3.12-8 and Exhibit 3.12-9. Traffic signal timings, peak-hour factors, and bicycle and pedestrian volumes at the intersection were assumed to remain the same as existing conditions. Table 3.12-6 also includes the operations results for the Existing without Project conditions for comparison purposes.

**Table 3.12-6: Existing Conditions With Project Peak-hour Level of Service**

| Intersection | Control[1] | Peak Hour | Existing Without Project | | Existing Without Bypass Road | | Existing With Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 12<br>13 | B<br>B | 12<br>14 | B<br>B | 14<br>13 | B<br>B |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 8<br>9 | A<br>A | 8<br>9 | A<br>A | 8<br>9 | A<br>A |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (10)<br>0 (14) | A (A)<br>A (B) | 0 (10)<br>0 (14) | A (A)<br>A (B) | 0 (9)<br>0 (14) | A (A)<br>A (B) |

## Table 3.12-6 (cont.): Existing Conditions With Project Peak-hour Level of Service

| Intersection | Control[1] | Peak Hour | Existing Without Project | | Existing Without Bypass Road | | Existing With Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 (21)<br>5 **(62)** | A (C)<br>A **(F)** | 2 (21)<br>5 **(65)** | A (C)<br>A **(F)** | 2 (21)<br>4 **(58)** | A (C)<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | 2 (26)<br>6 **(38)** | A (D)<br>A **(E)** | 3 (27)<br>7 **(40)** | A (D)<br>A **(E)** | 2 (26)<br>6 **(40)** | A (D)<br>A **(E)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (10) | A (B)<br>A (A) | 3 (11)<br>3 (10) | A (B)<br>A (A) | 2 (11)<br>3 (10) | A (B)<br>A (A) |
| 7. Pleasanton Sunol Road at Happy Valley Road | SSSC | AM<br>PM | 1 (9)<br>2 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) | 1 (10)<br>2 (9) | A (A)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) | 1 (9)<br>1 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) |

Notes:
1 SSSC = side-street stop controlled intersection; AWSC = all way stop control; Signal = signalized intersection.
2 Average intersection delay calculated for signalized intersections using the 2000 HCM method.
3 For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2018.

Results of the level of service analysis show that the project would contribute to a slight worsening of already deficient operations for side-street movements at both the Sunol Boulevard northbound and southbound ramp intersections. All other study intersections would continue to operate within the City's level of service standard.

*Signal Warrant Assessment*

The peak-hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the Existing with Project conditions. Detailed signal warrant worksheets are provided in Appendix I, which show that the intersection of I-680 Southbound Ramps at Sunol Boulevard would continue to meet peak-hour signal warrants with the addition of project traffic, without or with the bypass road. No other intersections would satisfy peak-hour signal warrants.

*Roadway Segments*

The amount of project traffic that is expected on each of the study roadway segments was estimated based on the project trip generation and trip distribution under conditions without and with the bypass road. For conditions with the bypass road, shifts for existing traffic shifts were also considered, with the resulting volumes summarized in Table 3.12-7 and Exhibit 3.12-10.

Without the bypass road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass

road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic.

The amount of traffic that is considered reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated on Sycamore Creek Way. The volume increases shown in Table 3.12-7 would be slightly higher for some roadway segments when the golf course experiences peak levels of activity. This fluctuation in background traffic volumes would not change the overall conclusions of this roadway segment assessment.

Although there is not a standard of significance for daily roadway volumes on residential streets in Pleasanton, the project could increase traffic volumes on a roadway segment that does not meet current design standards (Happy Valley Road, east of Pleasanton Sunol Road), which could increase traffic conflicts. This potential impact is discussed in Impact TRANS-5.

## Table 3.12-7: Existing With Project Daily Traffic Volumes

| Roadway | Facility Type | Existing Weekday Daily Traffic | Percent Daily Fluctuation | Existing with Project without Bypass Road | | | Existing with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Shift of Existing Traffic | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 860 | ±4% | 110 | 970 | **13%** | -200 | 660 | 0 | 660 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 500 | ±2% | 30 | 530 | **6%** | -80 | 420 | 0 | 420 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,290 | ±4% | 10 | 1,300 | 1% | -120 | 1,170 | 0 | 1,170 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 3,470 | ±5% | 240 | 3,710 | **7%** | 800[5] | 4,270 | 370 | 4,640 | **9%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,470 | ±6% | 240 | 1,710 | **16%** | -400 | 1,070 | 0 | 1,070 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,480 | ±7% | 0 | 1,480 | 0% | 800[5] | 2,280 | 370 | 2,650 | **16%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,020 | ±8% | 240 | 1,260 | **24%** | -400 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 600 | ±3% | 130 | 730 | **22%** | -400 | 200 | 0 | 200 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 540 | ±1% | 130 | 670 | **24%** | -400 | 140 | 0 | 140 | 0% |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 870[3] | ±3 | -800 | 70[4] | — | -800 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 870 | ±8% | 0 | 870 | 0% | 800[5] | 1,670 | 370 | 2,040 | **22%** |

## Table 3.12-7 (cont.): Existing With Project Daily Traffic Volumes

| Roadway | Facility Type | Existing Weekday Daily Traffic | Percent Daily Fluctuation | Existing with Project without Bypass Road | | | Existing with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Shift of Existing Traffic | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |

Notes:
**Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.
[1] Based on weekday daily Project trip generation and distribution percentages.
[2] Reflects shifts of existing traffic with the project construction of a cul-de-sac at Westbridge Lane at Sanctuary Lane.
[3] Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment.
[4] Reflects remaining traffic volume estimate on the portion of Happy Valley Road between Alisal Street and Sanctuary Lane.
[5] During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of this analysis, although it would decrease the percent increase in traffic volumes due to the project.
Source: Fehr & Peers, 2018

*Impacts and Mitigation*

**I-680 Northbound Ramps/Sunol Boulevard**

The I-680 Northbound Ramps at Sunol Boulevard intersection operate at an overall acceptable service level during the PM peak hour, although deficient LOS F operations are experienced for the side-street movement. Peak-hour signal warrants are not satisfied at this intersection in the existing condition, even considering the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement, but would not increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Although there is not a project-specific impact at this intersection, the City of Pleasanton does have plans to improve the I-680 interchange at Sunol Boulevard and will be evaluating various alternatives which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps and improving the merge zone on I-680. The project would contribute its fair share towards these improvements through the payment of local and regional transportation impact fees. Therefore, the project impact to this intersection is considered less than significant and no mitigation is required.

**I-680 Southbound Ramps at Sunol Boulevard**

The I-680 Southbound Ramps at Sunol Boulevard intersection operates at an overall acceptable service level during the PM peak hour, although deficient LOS E operations are experienced for the side-street movement. Peak-hour signal warrants are satisfied at this intersection in the existing condition prior to the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement, but would not result in LOS F operations for the controlled movement, increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore, the project impact to this intersection is considered less than significant and no mitigation is required.

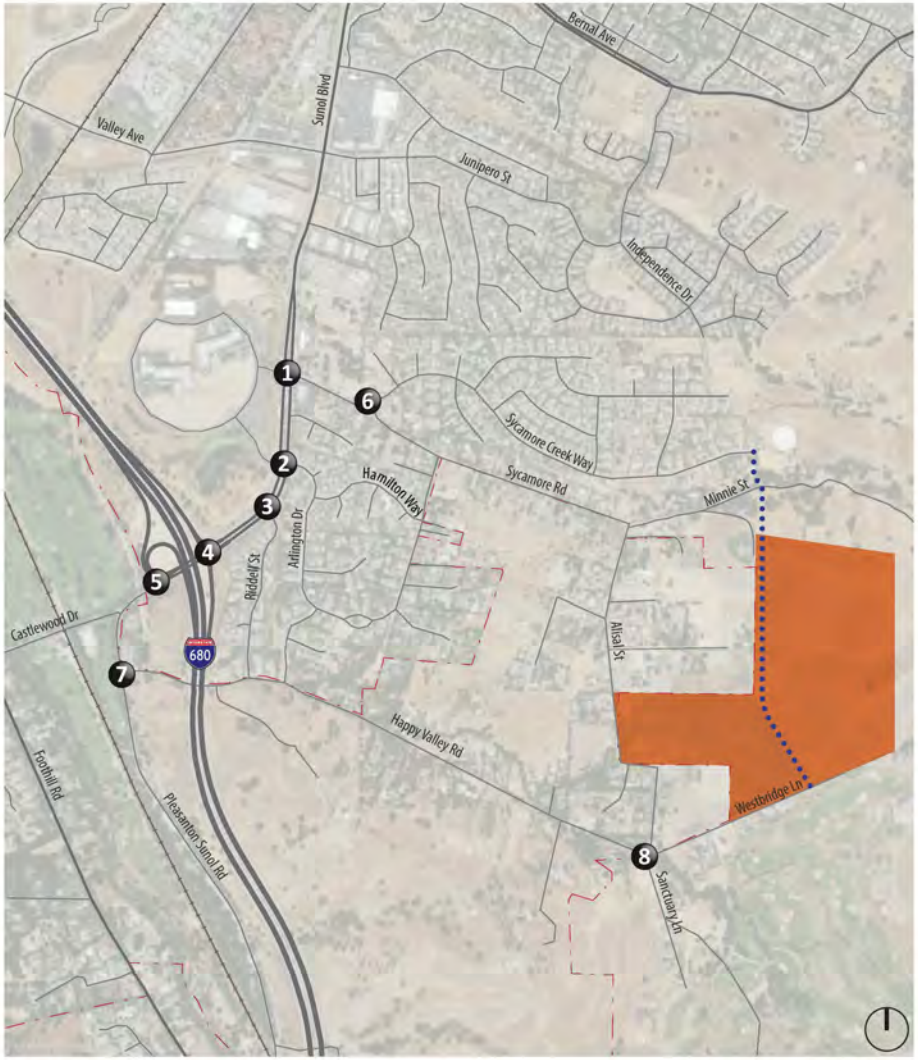
Although there is not a project specific impact at these intersections, the City of Pleasanton does have plans to improve the I-680 interchange at Sunol Boulevard and will be evaluating various alternatives which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps and improving the merge zone on I-680. The project would contribute its fair share towards these improvements through the payment of local and regional transportation impact fees.

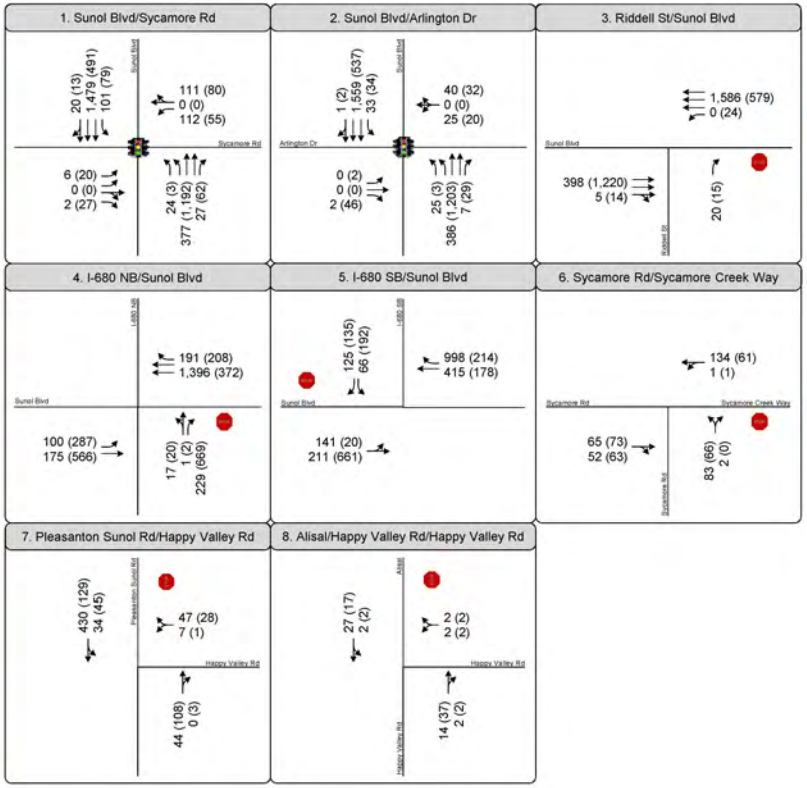
**Construction Activities**

Construction related activities could create potential conflicts with other roadway users, such as construction related activities resulting in lane closures along the project frontage, construction vehicles queuing within the public right-of-way awaiting entry to the site, construction worker parking in non-designated parking areas, or construction debris on public streets. Although construction impacts would be temporary in nature, this impact is considered potentially significant. Implementation of Mitigation Measure TRANS-1 would reduce the temporary construction impact to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

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# Exhibit 3.12-8
## Existing With Project Without Bypass Road Peak Hour Traffic Volumes

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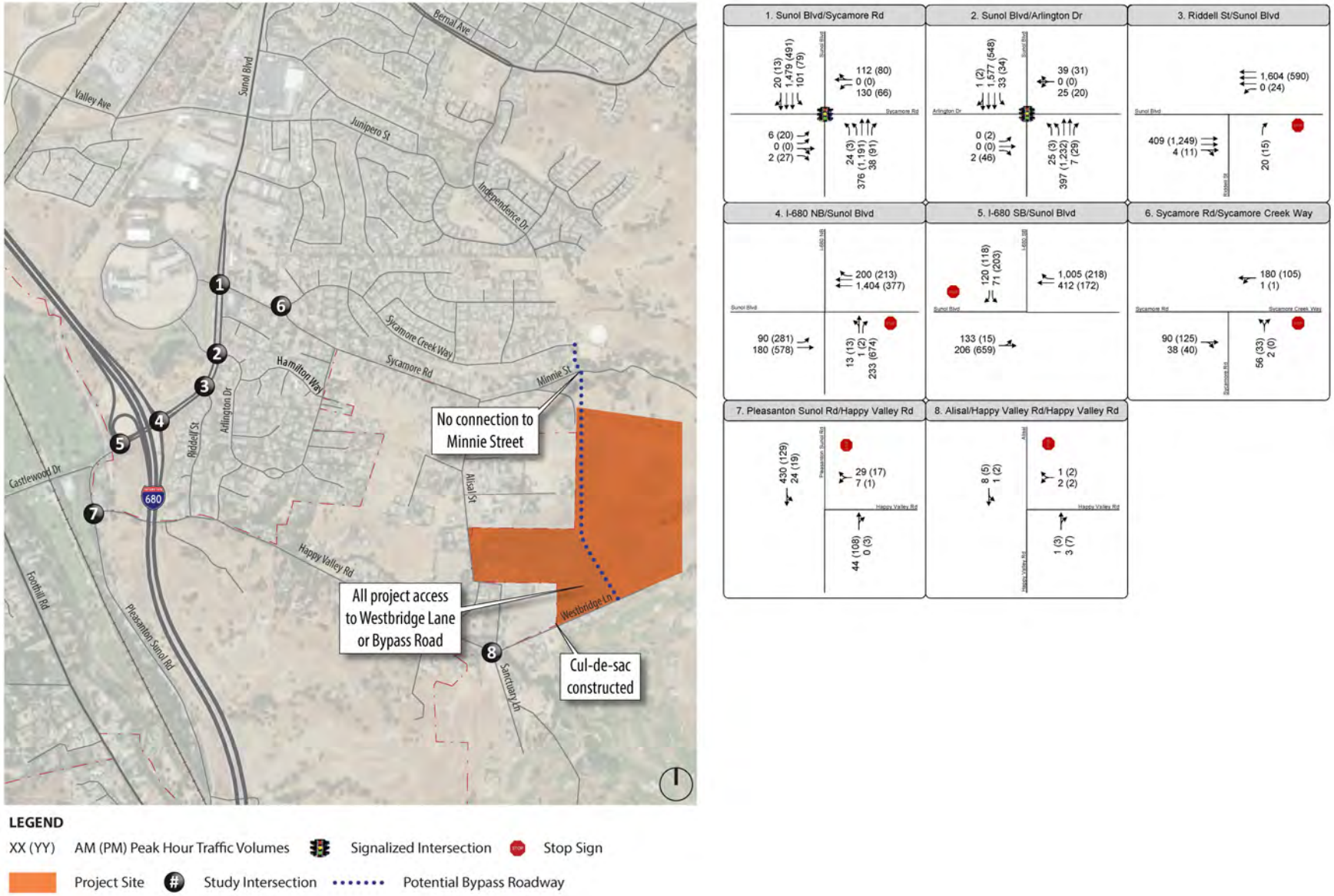


Source: Fehr & Peers, February 2018.

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Exhibit 3.12-9
Existing With Project With Bypass Road Peak Hour Traffic Volumes

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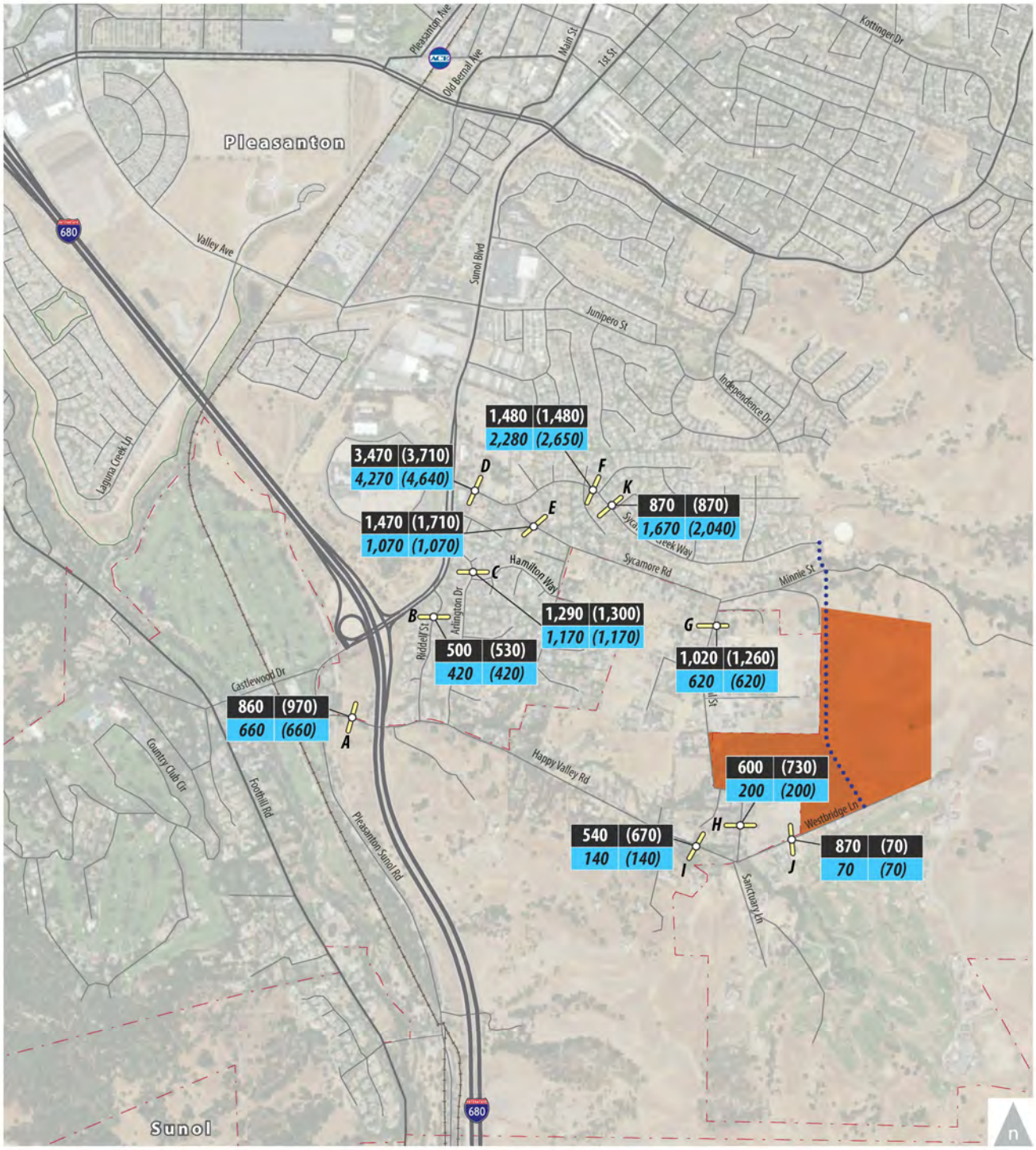


Source: Fehr & Peers, June 2018.

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Exhibit 3.12-10
Existing Weekday Without and With Project Daily Roadway Segment Volumes

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### *Mitigation Measures*

**MM TRANS-1** Prior to the commencement of construction, the project applicant shall retain a qualified transportation consultant to prepare and submit a construction traffic management plan to the City of Pleasanton for review and approval. The plan shall include the following elements:

- Project staging plan to maximize on-site storage of materials and equipment
- A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes
- Permitted construction hours
- Location of construction staging
- Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations
- Provisions for street sweeping to remove construction related debris on public streets

### *Level of Significance After Mitigation*

Less than significant impact.

## Near-Term Conditions

**Impact TRANS-2: The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Near-Term With Project Conditions.**

### *Impact Analysis*

This impact discussion presents the results of the level of service calculations under Near-Term conditions without and with the project. Near-Term conditions reflect a 5- to 10-year time horizon, during which development of the project could be completed. Traffic volumes for Near-term without Project conditions comprise existing volumes plus traffic generated by approved but not yet constructed and occupied developments in the area, plus roadway network improvements that are conditioned by development considered in the traffic forecasts. Other reasonably foreseeable roadway improvements were also considered. Near-term with Project conditions are defined as Near-term without Project conditions plus net new traffic generated by the proposed project. Conditions without and with the bypass road are assessed.

Near-Term without Project conditions include transportation system improvements that are planned and funded, or conditioned on approved development, and traffic volume increases due to approved and pending developments plus regional growth. Traffic volumes for the Near-Term condition were developed based on preliminary forecasts prepared for the City of Pleasanton Model Update, representing existing traffic, plus traffic from approved developments in the City. These forecasts were reviewed to ensure that approved and pending projects in the area were considered in the forecasts, which include the Lund Ranch Development that is approved to construct 31 single-family

homes that would have access through Sunset Creek Lane and 11 single-family homes with access through Lund Ranch Road, and up to 49 single-family homes within the study area on various parcels including the Callippe Preserve/Municipal Golf Course, Bach Property and TTK property. The forecasts also reflect additional development at the ThermoFisher Scientific Campus on the west side of Sunol Boulevard at Sycamore Road and Arlington Drive.

Although no roadway improvements are assumed in the immediate project area that affect study intersection configurations, improvements to State Route 84 were assumed, which is expected to shift some regional through traffic from Sunol Boulevard to State Route 84, as well as completion of high-occupancy vehicle lanes on Interstate 680 from north of Interstate 580 through the Sunol Boulevard interchange. The resulting Near-Term without Project traffic volumes are shown on Exhibit 3.12-11. The project traffic volumes from Exhibit 3.12-6 and Exhibit 3.12-7 were added to the Near-term without Project traffic volumes to estimate the Near-term with Project traffic volumes, as shown on Exhibit 3.12-12 for conditions without the bypass road and Exhibit 3.12-13 for conditions with the bypass road. The Near-Term with Project traffic volumes also consider the shifts of existing and projected traffic through the project (Exhibit 3.12-12), and to the bypass road (Exhibit 3.12-13).

*Intersection Levels of Service*

Level of service calculations were conducted to evaluate intersection operations under Near-term conditions both without and with the project, and without and with the bypass road. The LOS results are summarized in Table 3.12-8. The corresponding LOS calculation sheets are included in Appendix I.

In the near-term condition, operations of the Sunol Boulevard at I-680 ramps would further degrade, but all other study intersections would continue to operate at acceptable levels. The addition of project traffic would further degrade operations at the interchange, but all other study intersections would continue to operate at an acceptable service level without or with the bypass road.

## Table 3.12-8: Near-Term Conditions Peak-hour Intersection Levels of Service

| Intersection | Control[1] | Peak Hour | Near-Term without Project | | Near-Term with Project without Bypass Road | | Near-Term with Project with Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 21<br>27 | C<br>C | 21<br>30 | C<br>C | 21<br>25 | C<br>C |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 17<br>18 | B<br>B | 17<br>19 | B<br>B | 17<br>18 | B<br>B |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (13)<br>0 (16) | A (B)<br>A (C) | 0 (13)<br>0 (16) | A (B)<br>A (C) | 0 (11)<br>0 (16) | A (B)<br>A (C) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 **(46)**<br>4 **(>90)** | A (E)<br>A (F) | 2 (47)<br>5 (>90) | A (E)<br>A (F) | 2 (41)<br>4 (>90) | A (E)<br>A (F) |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | **>90 (>90)**<br>22 **(>90)** | **F (F)**<br>C **(F)** | **>90 (>90)**<br>24 **(>90)** | **F (F)**<br>C **(F)** | **>90 (>90)**<br>26 **(>90)** | **F (F)**<br>D **(F)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (11) | A (B)<br>A (B) | 2 (11)<br>2 (11) | A (B)<br>A (B) | 1 (12)<br>1 (11) | A (B)<br>A (B) |
| 7. Pleasanton Sunol Road at Happy Valley Road | SSSC | AM<br>PM | 2 (11)<br>2 (11) | A (B)<br>A (B) | 2 (11)<br>2 (11) | A (B)<br>A (B) | 1 (11)<br>1 (10) | A (B)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 6 (9)<br>5 (9) | A (A)<br>A (A) | 1 (9)<br>1 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) |

Notes:
[1] SSSC = side-street stop-controlled intersection; Signal = signalized intersection.
[2] Average intersection delay calculated for signalized intersections using the 2000 HCM method.
[3] For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2018.

*Signal Warrant Assessment*

The peak-hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the Near-term condition. Detailed signal warrant worksheets are provided in Appendix I, which show that the unsignalized intersection of Sunol Boulevard at I-680 Southbound Ramps would continue to meet signal warrants. No other unsignalized intersections would meet signal warrants.

*Roadway Segments*

The amount of project traffic that is expected on each of the study roadway segments in the near-term condition was estimated based on the existing traffic, projections of new traffic from approved and pending projects, and project traffic under conditions without and with the bypass road. For conditions with the bypass road, existing traffic shifts were also considered, with the resulting volumes summarized in Table 3.12-9 and Exhibit 3.12-14.

Without the bypass road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic. The volume increases shown in Table 3.12-9 would be slightly higher for some roadway segments when the golf course experiences peak levels of activity. This fluctuation in background traffic volumes would not change the overall conclusions of this roadway segment assessment.

The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated on Sycamore Creek Way.

Although there is not a standard of significance for daily roadway volumes on residential streets in Pleasanton, the project could increase traffic volumes on a roadway segment that does not meet current design standards (Happy Valley Road, east of Pleasanton Sunol Road) which could increase traffic conflicts. This potential impact is discussed in Impact TRANS-5.

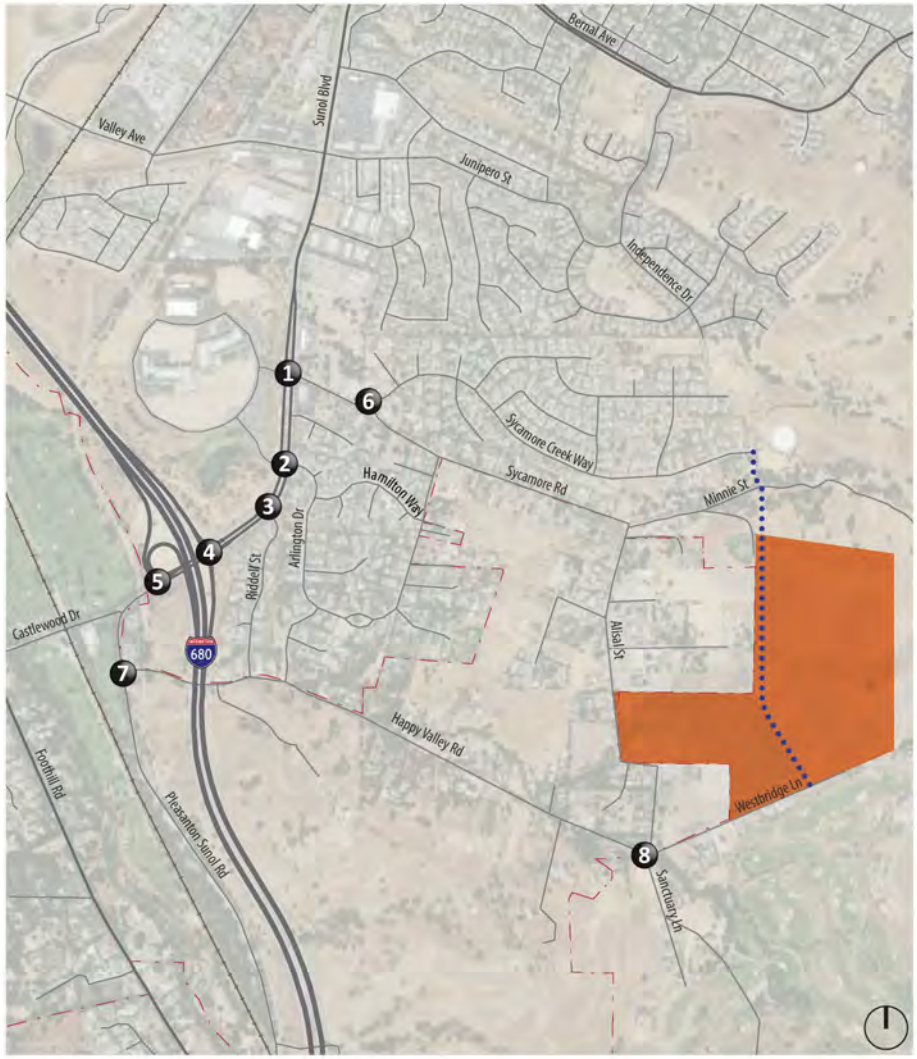
## Table 3.12-9: Near-Term Daily Traffic Volume Assessment

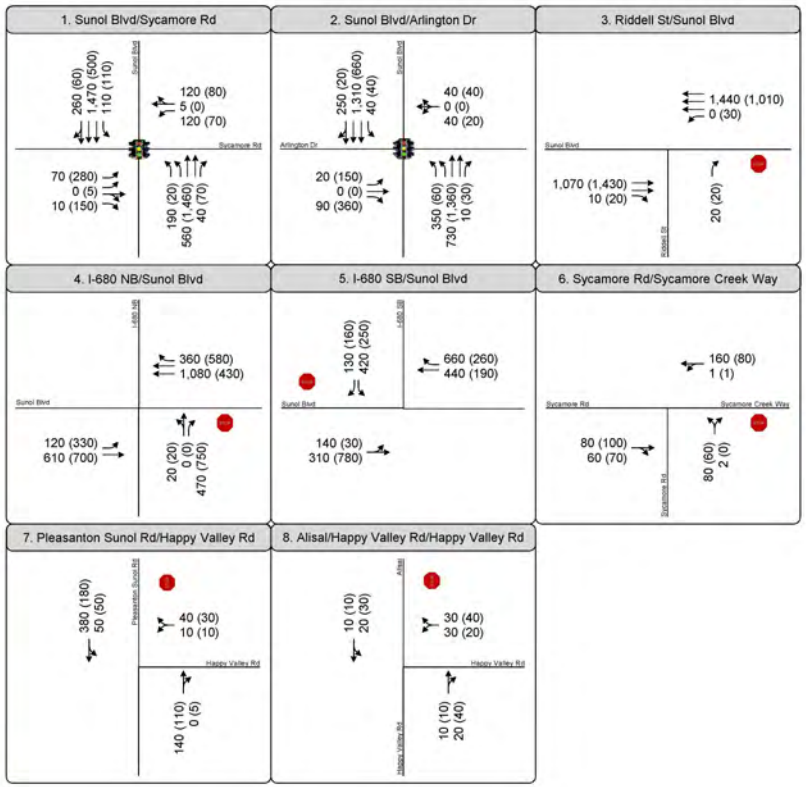
| Roadway | Facility Type | Near-term Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Near-term with Project without Bypass Road | | | Near-Term with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 1,050 | ±4% | 110 | 1,160 | **10%** | -390 | 660 | 0 | 660 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 520 | ±2% | 30 | 550 | **6%** | -100 | 420 | 0 | 420 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,310 | ±4% | 10 | 1,320 | 1% | -140 | 1,170 | 0 | 1,170 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 4,020 | ±5% | 240 | 4,260 | **6%** | 1,260[4] | 5,050 | 370 | 5,490 | **7%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,700 | ±6% | 240 | 1,940 | **14%** | -630 | 1,070 | 0 | 1,070 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,770 | ±7% | 0 | 1,770 | 0% | 1,260[4] | 3,030 | 370 | 3,470 | **12%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,250 | ±8% | 240 | 1,490 | **19%** | -630 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 830 | ±3% | 130 | 960 | **16%** | -630 | 200 | 0 | 200 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 770 | ±1% | 130 | 900 | **17%** | -630 | 140 | 0 | 140 | 0% |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 1,330[2] | ±3 | -1,260 | 70[3] | — | -1,260 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 1,160 | ±8% | 0 | 1,160 | 0% | 1,260[4] | 2,420 | 370 | 2,790 | **15%** |

## Table 3.12-9 (cont.): Near-Term Daily Traffic Volume Assessment

| Roadway | Facility Type | Near-term Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Near-term with Project without Bypass Road | | | Near-Term with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic | Total Traffic | Percent Increase Due to Project Trips Only |

Notes:
**Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.
[1] Based on weekday daily Project trip generation and distribution percentages.
[2] Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, existing traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment due to golf course activities, a 230-vehicle increase from existing condition, which would result in the same 230-vehicle increase under near-term without project conditions.
[3] Reflects remaining traffic volume estimate on the portion of Happy Valley Road between Alisal Street and Sanctuary Lane.
[4] During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of this analysis, although it would decrease the percent increase in traffic volumes due to the project.
Source: Fehr & Peers, 2018




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes | Signalized Intersection | Stop Sign

Project Site | Study Intersection | Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

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Exhibit 3.12-11
Near-Term Without Project Peak Hour Traffic Volumes

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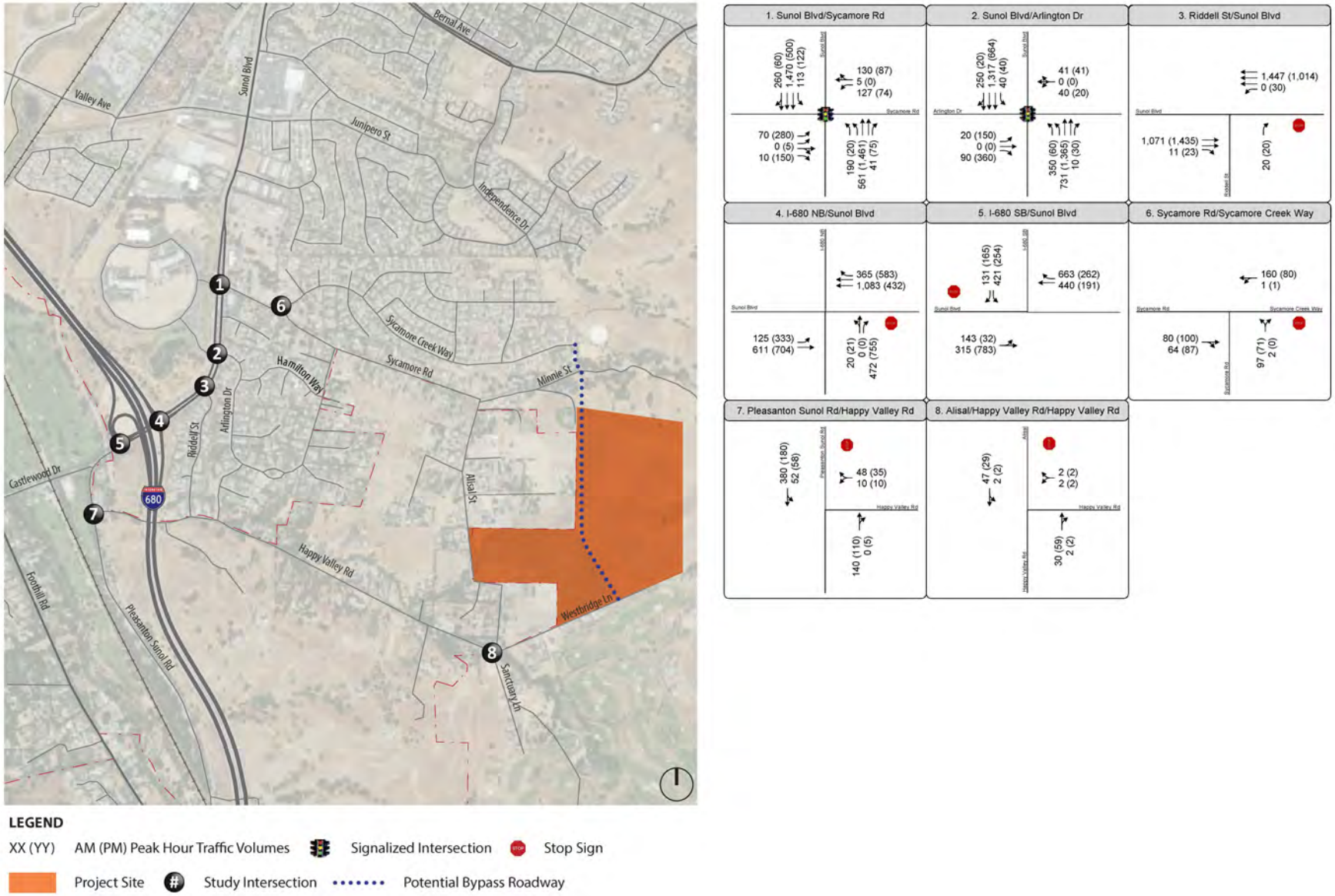


Source: Fehr & Peers, February 2018.

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Exhibit 3.12-12
Near-Term With Project Without Bypass Road Peak Hour Traffic Volumes

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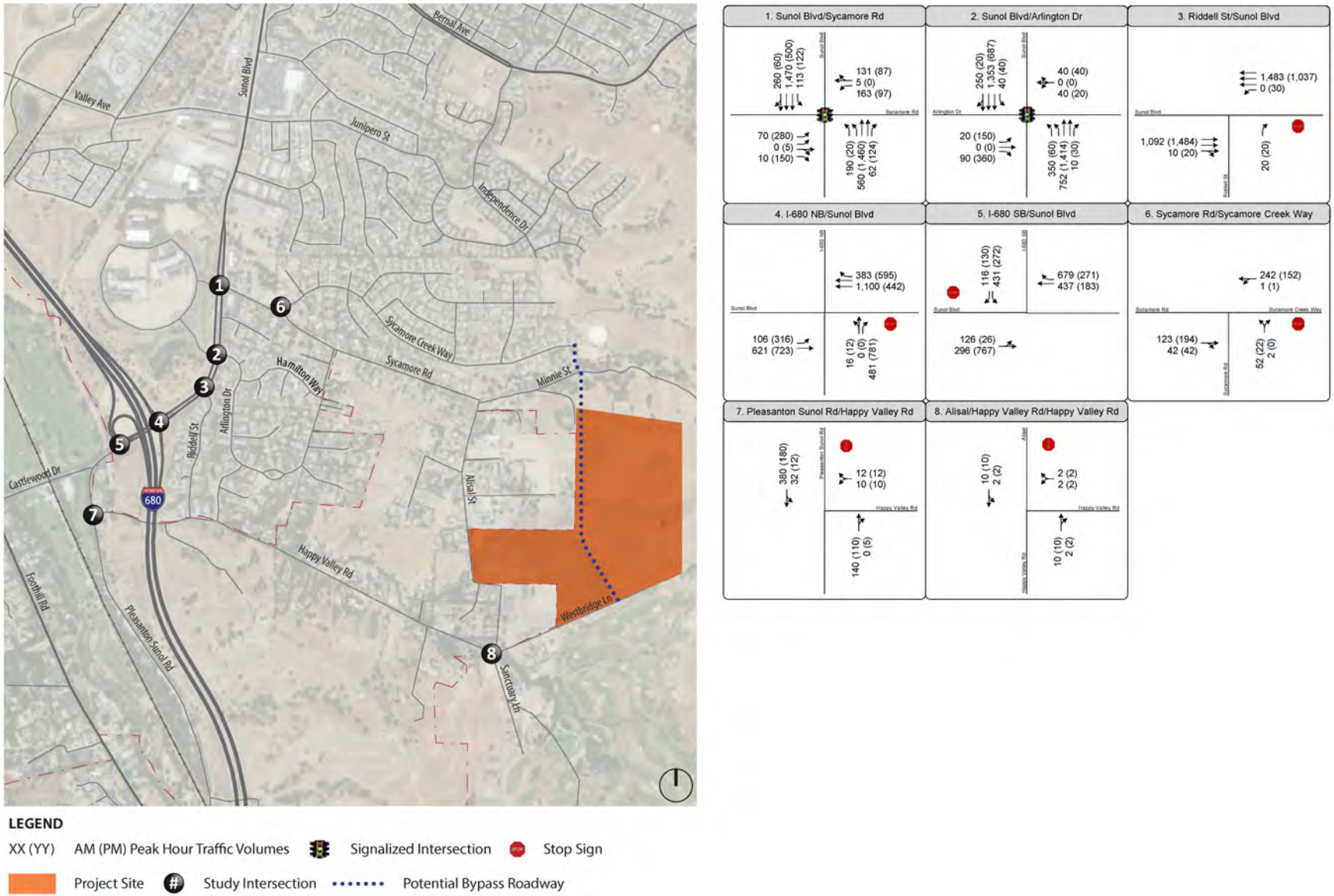


Source: Fehr & Peers, February 2018.

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Exhibit 3.12-13
Near-Term With Project With Bypass Road Peak Hour Traffic Volumes

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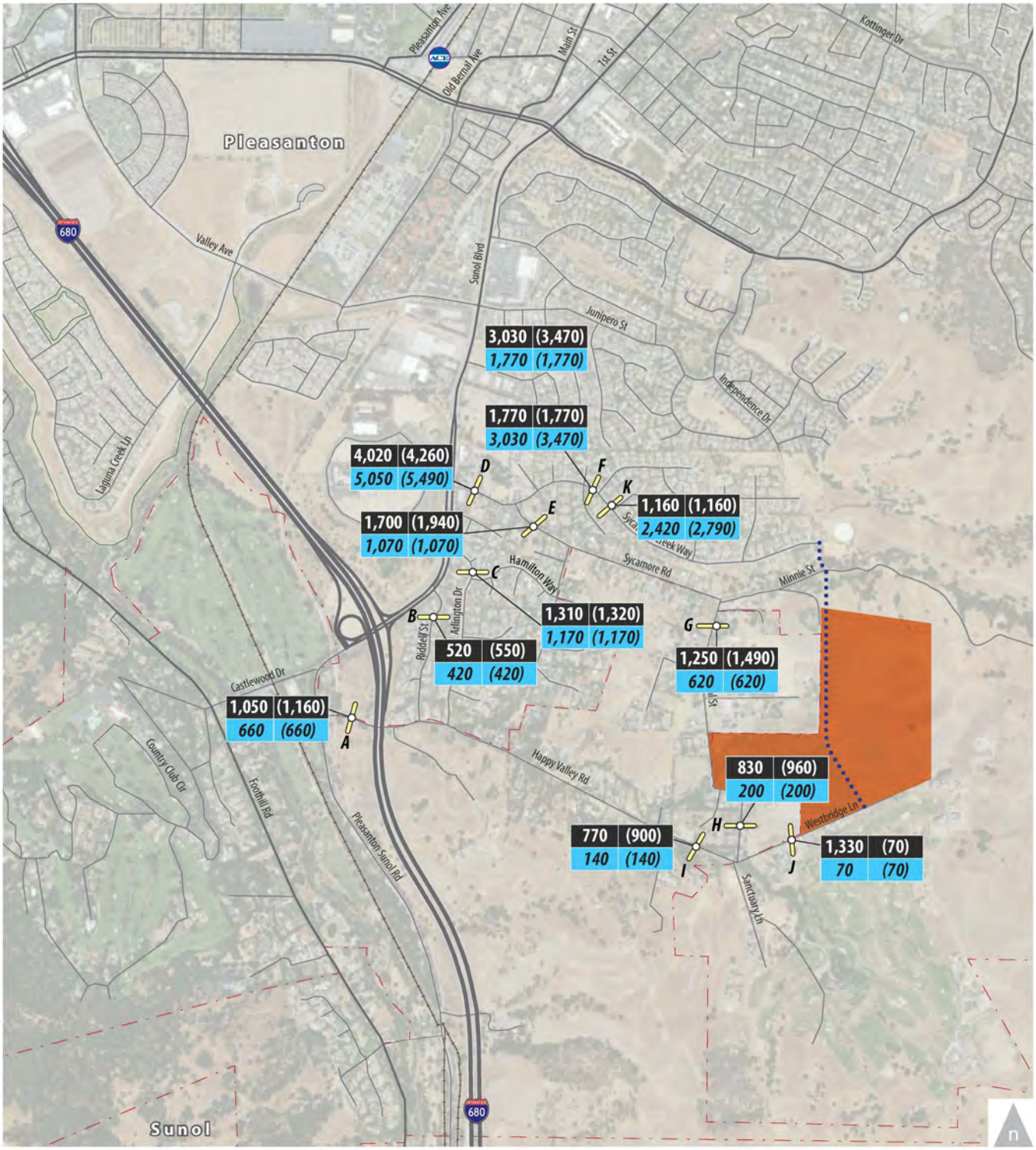


Source: Fehr & Peers, June 2018.

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Exhibit 3.12-14
Near-Term Weekday Without and With Project Daily Roadway Segment Volumes

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*Near-Term Intersection Impacts*

**I-680 Northbound Ramps at Sunol Boulevard**

The I-680 Northbound Ramps at Sunol Boulevard intersection is projected to operate at an overall acceptable service level during both the morning and evening peak hours, although deficient operations are experienced for the side-street movement (LOS E/AM peak, LOS F/PM peak). Peak-hour signal warrants are not satisfied at this intersection in the near-term condition, even considering the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement during the PM peak hour from 122 seconds to 130 seconds, but would not increase delay by more than 30 seconds during either peak hour or increase traffic on the controlled approach by more than 10 vehicles per lane during either peak hour. Therefore, the project impact to this intersection is considered less-than-significant and no mitigation is required.

**I-680 Southbound Ramps at Sunol Boulevard**

The I-680 Southbound Ramps at Sunol Boulevard intersection is projected to operate at an overall unacceptable level during the morning peak hour and an acceptable service level during the PM peak hour. Deficient LOS F operations would be experienced for the side-street movement in both peak hours. Peak-hour signal warrants are satisfied at this intersection in the existing condition, prior to the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour from 652 seconds to 676 seconds and during the evening peak hour from 122 seconds to 130 seconds, but would not increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore, the project impact to this intersection is considered less than significant and no mitigation is required.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary**.**

### *Level of Significance After Mitigation*

Less than significant impact.

## Cumulative Conditions

| | |
|---|---|
| **Impact TRANS-3:** | **The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Cumulative With Project Conditions.** |

### *Impact Analysis*

This chapter presents the results of the level of service calculations under cumulative conditions without and with the project. Traffic volumes for the Cumulative without Project condition consist of existing volumes plus traffic generated by approved but not yet constructed and occupied developments in the area, plus traffic from projects consistent with the General Plan that could be developed. Cumulative with Project conditions are defined as Cumulative without Project conditions

plus net new traffic generated by the proposed project. Conditions without and with the bypass road are assessed.

Cumulative without Project conditions include:

- Transportation system improvements that are planned with the reasonable expectation of being funded, or are conditioned on approved development,
- Traffic volume increases due to approved and pending developments,
- Development that could occur under the current General Plan plus regional growth.

Traffic volumes for the Cumulative condition were developed based on preliminary forecasts prepared for the City of Pleasanton Model Update, representing existing traffic, plus traffic from approved developments in the City, and development that could occur under the current General Plan plus regional growth. These forecasts were developed using a computerized traffic model and represent likely traffic conditions in the area over the next 20 to 25 years. These forecasts were reviewed to ensure that the appropriate level of development was considered, including near-term development discussed in Impact TRANS-2, plus additional development in the area that could occur. Aside from development on the project site, development of an additional 40 single-family homes within the Happy Valley area was identified in the model, which includes development of between one and eight homes of a number of parcels distributed throughout the area.

Although no roadway improvements are assumed in the immediate project area that would affect study intersection configurations, improvements to State Route 84 were assumed, which is expected to shift some regional through traffic from Sunol Boulevard to State Route 84, as well as completion of high-occupancy vehicle lanes on Interstate 680 from north of Interstate 580 through the Sunol Boulevard interchange. The resulting Cumulative without Project traffic volumes are shown on Exhibit 3.12-15. The project traffic volumes from Exhibit 3.12-6 and Exhibit 3.12-7 were added to the Cumulative without Project traffic volumes to estimate the Cumulative with Project traffic volumes, as shown on Exhibit 3.12-16 for conditions without the bypass road and Exhibit 3.12-17 for conditions with the bypass road. The Cumulative with Project traffic volumes also consider the shifts of existing and projected traffic through the project (Exhibit 3.12-16), and with the bypass road (Exhibit 3.12-17).

*Intersection Levels of Service*

Level of Service calculations were conducted to evaluate intersection operations under Cumulative conditions both without and with the project. The LOS results are summarized in Table 3.12-10. Signal timings were optimized at the signalized intersections, as the City regularly monitors signal operations throughout the City to ensure optimal traffic flow through critical corridors. The corresponding LOS calculation sheets are included in Appendix I.

In the cumulative condition, operations of the Sunol Boulevard at I-680 ramps would further degrade, but all other study intersections would continue to operate at acceptable levels. The addition of project traffic would further degrade operations at the interchange, but all other study intersections would continue to operate at an acceptable service level without or with the bypass road.

## Table 3.12-10: Cumulative Conditions Peak-hour Intersection Levels of Service

| Intersection | Control[1] | Peak Hour | Cumulative without Project | | Cumulative with Project without Bypass Road | | Cumulative with Project with Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM | 20 | B | 20 | B | 21 | C |
| | | PM | 30 | C | 32 | C | 29 | C |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM | 17 | B | 17 | B | 17 | B |
| | | PM | 19 | B | 20 | B | 21 | C |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM | 0 (17) | A (C) | 0 (17) | A (C) | 0 (13) | A (B) |
| | | PM | 0 (16) | A (C) | 0 (16) | A (C) | 0 (17) | A (C) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM | 4 **(>90)** | A **(F)** | 4 **(>90)** | A **(F)** | 4 **(>90)** | A **(F)** |
| | | PM | 7 **(>90)** | A **(F)** | 7 **(>90)** | A **(F)** | 5 **(>90)** | A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM | **>90 (>90)** | **F (F)** | **>90 (>90)** | **F (F)** | **>90 (>90)** | **F (F)** |
| | | PM | **42 (>90)** | **E (F)** | **45 (>90)** | **E (F)** | **48 (>90)** | **E (F)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM | 3 (11) | A (B) | 3 (12) | A (B) | 2 (12) | A (B) |
| | | PM | 2 (11) | A (B) | 3 (11) | A (B) | 1 (11) | A (B) |
| 7. Pleasanton Sunol Road at Happy Valley Road | SSSC | AM | 2 (12) | A (B) | 2 (12) | A (B) | 2 (12) | A (B) |
| | | PM | 2 (11) | A (B) | 2 (11) | A (B) | 1 (11) | A (B) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM | 5 (9) | A (A) | 1 (9) | A (A) | 1 (9) | A (A) |
| | | PM | 5 (9) | A (A) | 0 (9) | A (A) | 1 (9) | A (A) |

Notes:
[1] SSSC = side-street stop-controlled intersection; Signal = signalized intersection.
[2] Average intersection delay calculated for signalized intersections using the 2000 HCM method.
[3] For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr & Peers, 2018.

*Signal Warrant Assessment*

The peak-hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the cumulative condition. Detailed signal warrant worksheets are provided in Appendix I, which show that the unsignalized intersection of Sunol Boulevard at I-680 Southbound Ramps would continue to meet signal warrants. No other unsignalized study intersection would meet signal warrants.

*Roadway Segments*

The amount of project traffic that is expected on each of the study roadway segments in the near-term condition was estimated based on the existing traffic, projections of new traffic from approved and pending projects, and project traffic under conditions without and with the bypass road. For conditions with the bypass road, existing traffic shifts were also considered, with the resulting volumes summarized in Table 3.12-11 and Exhibit 3.12-18.

Without the bypass Road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic. The volume increases shown in Table 3.12-11 would be slightly higher for some roadway segments when the golf course experiences peak levels of activity. This fluctuation in background traffic volumes would not change the overall conclusions of this roadway segment assessment.

The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated on Sycamore Creek Way.

Although there is not a standard of significance for daily roadway volumes on residential streets in Pleasanton, the project could increase traffic volumes on a roadway segment that does not meet current design standards (Happy Valley Road, east of Pleasanton Sunol Road) which could increase traffic conflicts. This potential impact is discussed below in Impact TRANS-5.

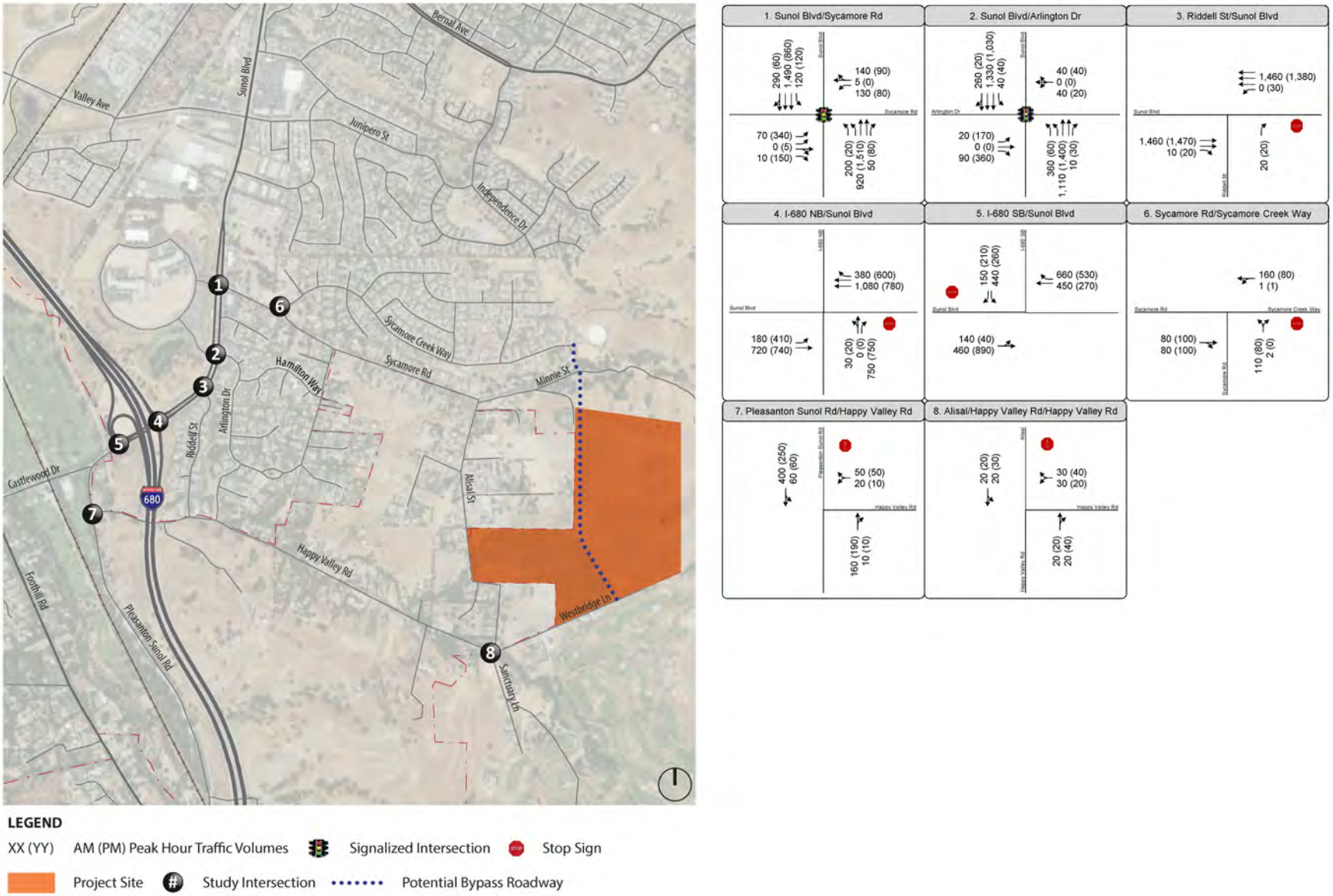
## Table 3.12-11: Cumulative Daily Traffic Assessment

| Roadway | Facility Type | Cumulative Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Cumulative with Project without Bypass Road | | | Cumulative with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 1,220 | ±4% | 110 | 1,330 | **9%** | -390 | 830 | 0 | 830 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 530 | ±2% | 30 | 560 | **6%** | -100 | 430 | 0 | 430 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,320 | ±4% | 10 | 1,330 | 1% | -140 | 1,180 | 0 | 1,180 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 4,210 | ±5% | 240 | 4,450 | **6%** | 1,260[4] | 5,240 | 370 | 5,610 | **7%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,890 | ±6% | 240 | 2,130 | **13%** | -630 | 1,260 | 0 | 1,260 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,770 | ±7% | 0 | 1,770 | 0% | 1,260[4] | 3,030 | 370 | 3,400 | **12%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,250 | ±8% | 240 | 1,490 | **19%** | -630 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 850 | ±3% | 130 | 980 | **15%** | -630 | 220 | 0 | 220 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 790 | ±1% | 130 | 920 | **16%** | -630 | 160 | 0 | 160 | 0% |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 1,330[2] | ±3 | 0 | 70[3] | — | -1,260 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 1,160 | ±8% | 0 | 1,160 | 0% | 1,260[4] | 2,420 | 370 | 2,790 | **15%** |

## Table 3.12-11 (cont.): Cumulative Daily Traffic Assessment

| Roadway | Facility Type | Cumulative Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Cumulative with Project without Bypass Road | | | Cumulative with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic | Total Traffic | Percent Increase Due to Project Trips Only |

Notes:
**Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.
[1] Based on weekday daily Project trip generation and distribution percentages.
[2] Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, existing traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment due to golf course activities, a 230-vehicle increase from existing condition, which would result in the same 230-vehicle increase under cumulative without project conditions.
[3] Reflects remaining traffic volume estimate on the portion of Happy Valley Road between Alisal Street and Sanctuary Lane.
[4] During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of the analysis, although it would decrease the percent increase in traffic volumes due to the project.
Source: Fehr & Peers, 2018




Source: Fehr & Peers, February 2018.

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Exhibit 3.12-15
Cumulative Without Project Peak Hour Traffic Volumes

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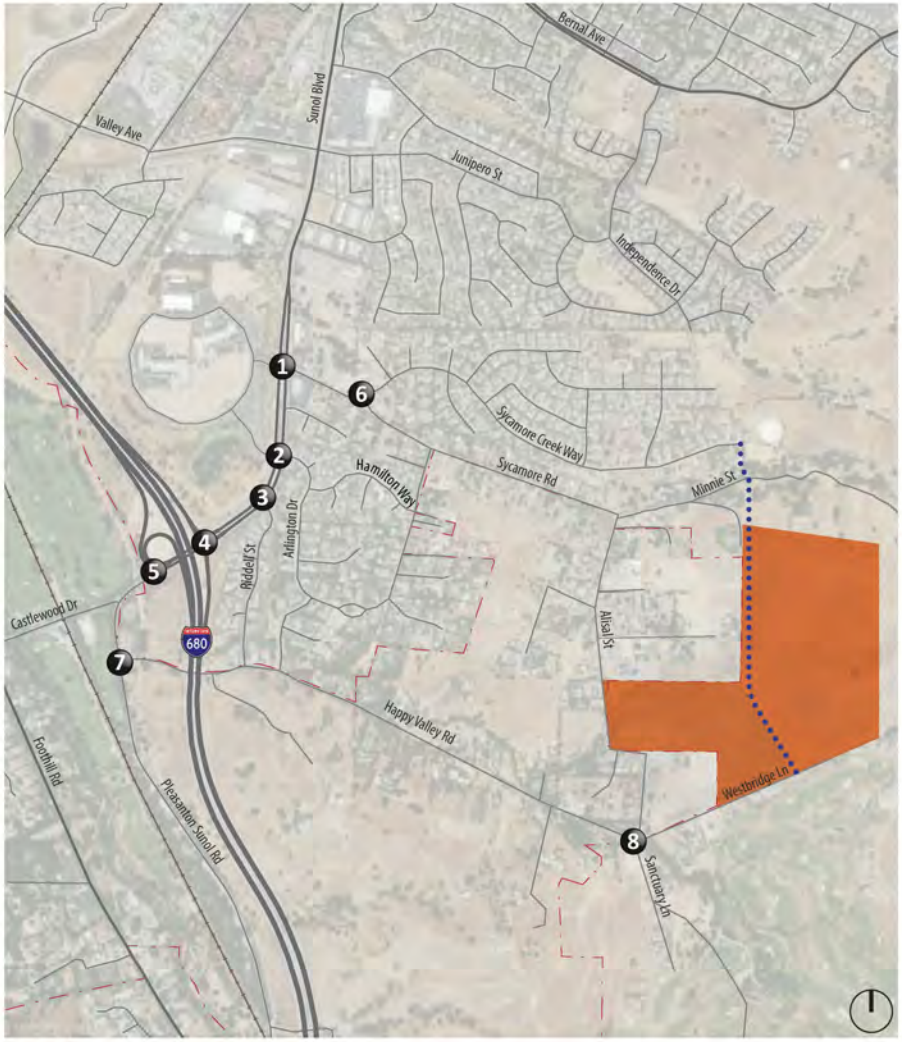


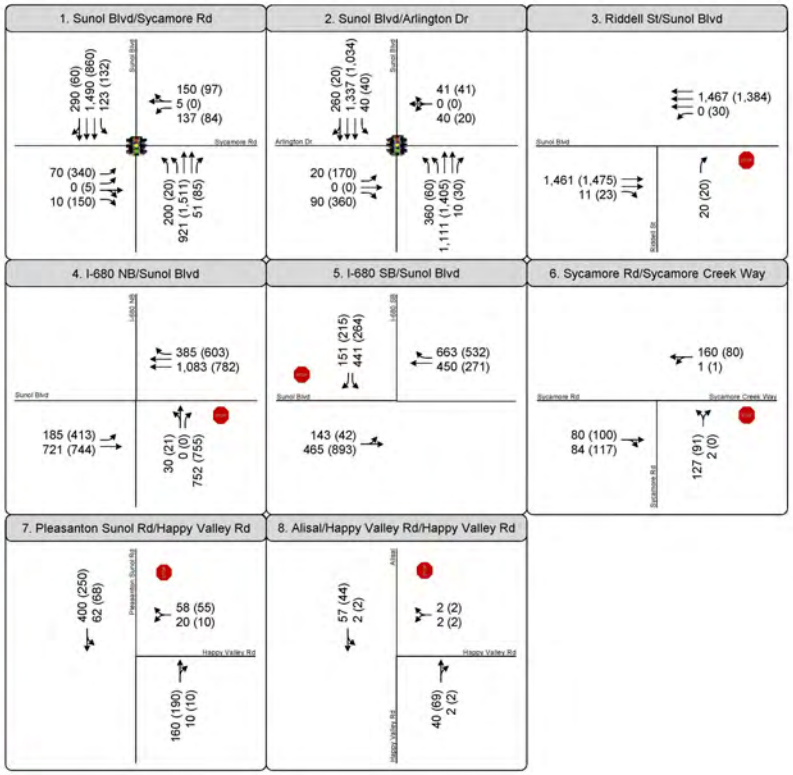


**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Source: Fehr & Peers, February 2018.

FIRSTCARBON SOLUTIONS™

Exhibit 3.12-16

Cumulative With Project Without Bypass Road Peak Hour Traffic Volumes

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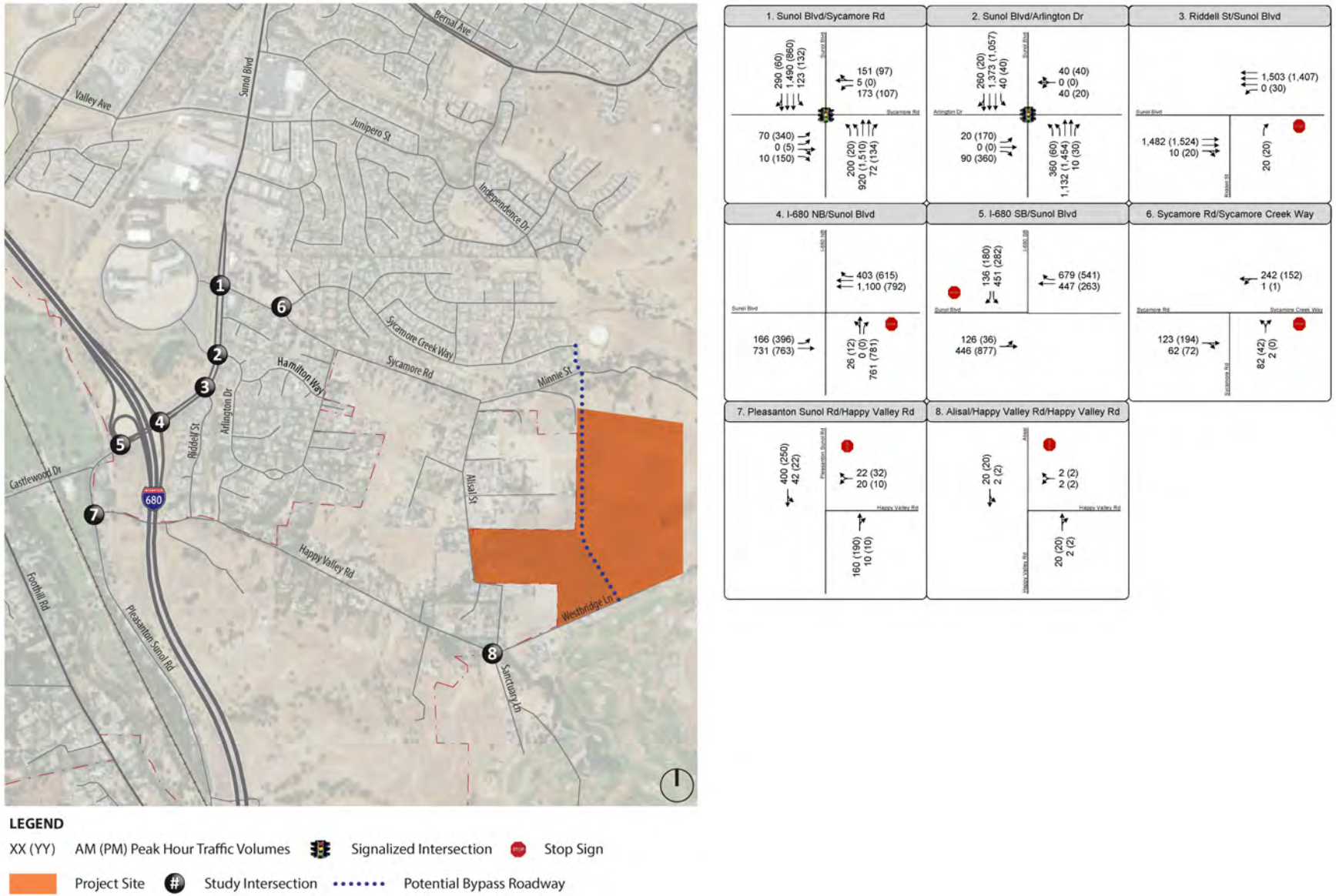


Source: Fehr & Peers, February 2018.

FIRSTCARBON SOLUTIONS™

Exhibit 3.12-17
Cumulative With Project With Bypass Road Peak Hour Traffic Volumes

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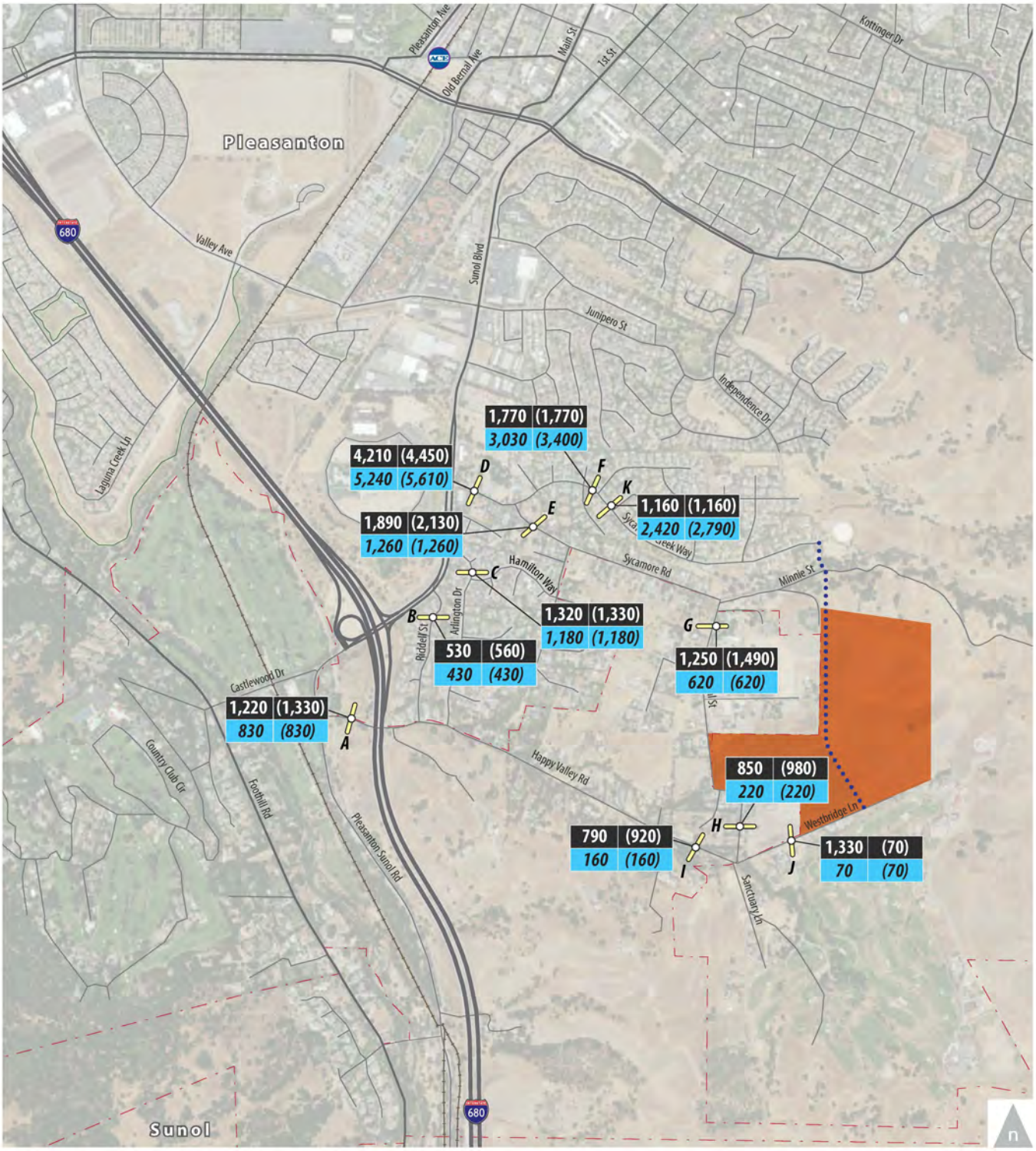


**LEGEND**

Project Site

XX (YY) — Without Bypass Road: Without Project (With Project)

XX (YY) — With Bypass Road: Without Project (With Project)

X — Study Segment

Potential Bypass Roadway

Source: Fehr & Peers, June 2018.

FIRSTCARBON SOLUTIONS™

Exhibit 3.12-18

Cumulative Weekday Without and With Project Daily Roadway Segment Volumes

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*Impacts and Mitigation Measures*

**I-680 Northbound Ramps at Sunol Boulevard**

The I-680 Northbound Ramps at Sunol Boulevard intersection is projected to operate at an overall acceptable service level during both the morning and evening peak hours in the cumulative condition, although deficient operations are experienced for the side-street movement. Peak-hour signal warrants are not satisfied at this intersection in the cumulative condition, even considering the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour from 125 seconds to 133 seconds and during the evening peak hour from 461 seconds to 492 seconds. As project traffic would increase delay by more than 30 seconds, this increase is considered significant. This impact would not occur under conditions with the bypass road.

Mitigation Measure TRANS-3 requires the applicant to pay all fair-share local and regional transportation fees. The City of Pleasanton plans to improve the I-680 interchange at Sunol Boulevard and is undertaking a process to evaluate various alternatives in coordination with Caltrans which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps, and improving the merge zone on I-680. This project is fully funded through the design stage in the Capital Improvement Program, including provisions to reimburse Caltrans for their costs, which has been approved by the City Council. The remainder of the improvement project cost would be funded through the City's Development Impact Fee Program, which contains the full cost of potential improvements at this interchange. Implementation of MM TRANS-3 would reduce the proposed project's impacts to a less than significant level.

**I-680 Southbound Ramps at Sunol Boulevard**

The I-680 Southbound Ramps at Sunol Boulevard intersection is projected to operate at an overall unacceptable level during the morning peak hour and an acceptable service level during the evening peak hour in the cumulative condition. Deficient operations would be experienced for the side-street movement in both peak hours. Peak-hour signal warrants are satisfied at this intersection in the existing condition prior to the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour, but the amount of delay cannot be calculated. During the evening peak hour, delay would increase from 342 seconds to 362 seconds, less than 30 seconds. During the morning peak hour when delay cannot be calculated for the side-street movement, the project would not increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore, the project's impact to this intersection is considered less than significant and no mitigation is required.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM TRANS-3** Prior to issuance of building permits, the applicant shall pay all adopted local and regional transportation impact fees in accordance with the City's Development Impact Fee Program.

### *Level of Significance After Mitigation*

Less than significant impact.

## Congestion Management Program

**Impact TRANS-4: The project may 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.**

### *Impact Analysis*

The I-680/Sunol Boulevard interchange is a Congestion Management Plan facility. As discussed in Impacts TRANS-1 and TRANS-2, the I-680 Northbound Ramps at Sunol Boulevard intersection is projected to operate at an overall acceptable service level during both the morning and evening peak hours, although deficient operations are experienced for the side-street movement. Peak-hour signal warrants are not satisfied at this intersection in the Existing with Project and Near-Term with Project condition, even considering the addition of project traffic. As a result, impacts would be less than significant.

As discussed in Impact TRANS-3, under Cumulative with Project Conditions, the addition of project traffic would increase delay for the side-street movement during the morning peak hour from 125 seconds to 133 seconds and during the evening peak hour from 461 seconds to 492 seconds. As project traffic would increase delay by more than 30 seconds, this increase is considered significant. This impact would not occur under conditions with the bypass road. As discussed previously, the City of Pleasanton plans to improve the I-680 interchange at Sunol Boulevard and is undertaking a process to evaluate various alternatives in coordination with Caltrans. Furthermore, this project is fully funded through the Capital Improvement Program and has been approved by the City Council. The City's Development Impact Fee Program would fund the remainder of the potential improvements at this interchange. As a result, payment of all fair-share fees would go toward a fee program that directly Implementation of MM TRANS-3 would reduce the proposed project's impacts to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

Implement Mitigation Measure TRANS-3.

### *Level of Significance After Mitigation*

Less than significant impact.

## Roadway Safety

**Impact TRANS-5: The project may substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).**

### *Impact Analysis*

This impact determines the project's potential to substantially increase roadway safety hazards.

All vehicular site access is proposed to occur from Alisal Street, which connects to Sycamore Road and Happy Valley Road. As part of the project, a cul-de-sac on Westbridge Lane at Sanctuary Lane would be constructed, with all traffic on Westbridge Lane east of Sanctuary Lane rerouted through the project site, via the proposed Clubhouse Drive to Alisal Street. Operations of the site access intersection on Alisal Street were evaluated, as presented in Table 3.12-12, which shows the site access intersection would operate within the City's level of service standard in the cumulative condition.

**Table 3.12-12: Site Access Intersection Peak-hour Intersection Levels of Service—Without Bypass Road**

| Intersection | Control1 | Peak Hour | Cumulative with Project | |
|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] |
| Alisal Street at Clubhouse Drive | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) |

Notes:
[1] SSSC = side-street stop controlled intersection
[2] Average intersection delay calculated for signalized intersections using the 2000 HCM method.
[3] For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
Source: Fehr and Peers, 2018.

Although the site access intersection and other intersections internal to Happy Valley Road would operate within the City's level of service standard, the project would add traffic to roadways in the study area that have sharp curves (Alisal Street) and could create roadway compatibility issues related to trips to and from the Callippe Preserve Golf Course. Consequently, the project could potentially result in significant roadway hazards due to sharp curves. However, Mitigation Measures TRANS-5a and TRANS-5b would reduce these impacts to a less than significant level by ensuring that Alisal Street at Sycamore Road and Alisal Court would accommodate two-way travel, through calming traffic, such as speed lumps and radar speed signs, along Alisal Street. Under conditions with the bypass road, the project would not increase traffic on these facilities. Construction of the bypass road would change the travel patterns for existing traffic, further reducing vehicle traffic on these roadways. The daily roadway segment analysis presented in the preceding chapters indicates that future traffic volumes on Clubhouse Road through the project site could range from 1,260 (non-peak travel to golf course months) to 1,490 (peak travel to golf course months) daily vehicle trips in the cumulative condition. This is considered the upper limit for traffic volumes on local streets, and could create future conflicts between residents and through traffic coming to and from the golf course. However, Mitigation Measure TRANS-8 would require site plan design changes to separate

residential activities from travel along Clubhouse Drive by limiting direct driveway access to Clubhouse Drive, providing circular driveways such that vehicles do not need to back into the street, and providing sidewalks with a landscape buffer on both sides of the street. MM TRANS-5a and MM TRANS-5b would reduce impacts to a less than significant level.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM TRANS-5a** Prior to issuance of building permits, the project applicant shall:

- Install traffic calming measures along Alisal Street at Sycamore Road and at Alisal Court that are consistent with the rural nature of the roadway, subject to the review and approval of the Director of Community Development. Measures that could be considered include roundabouts, traffic circles, additional pavement markings, a speed lumps and radar speed signs.

**MM TRANS-5b** Prior to issuance of building permits, the project applicant shall submit site plans that show:

- Either revise the project plans to reduce the number of direct private driveway connections to Clubhouse Drive through the project site, or provide other measures acceptable to City of Pleasanton Traffic Engineering that would reduce potential conflicts between vehicles exiting driveways and traffic on Clubhouse Drive; and
- Provide sidewalks with a landscape buffer on both sides of the street

### *Level of Significance After Mitigation*

Less than significant impact.

## Emergency Access

**Impact TRANS-6: The project would not result in inadequate emergency access.**

### *Impact Analysis*

A significant impact would occur if the project would result in inadequate access for emergency services, such as fire, police, and medical services.

There are several factors that determine whether a project has sufficient access for emergency vehicles such as:

- Location of closest fire stations
- Number of access points (both public and emergency access only)
- Width of access points
- Width of internal roadways

The fire station closest to the site is located on Bernal Avenue at Oak Vista Way, approximately 3.5 miles from the project connection to Alisal Street. Emergency vehicle access would also be provided through the new Westbridge cul-de-sac, providing additional emergency vehicle access to the project site and surrounding area if the connection to Alisal Street at Clubhouse Drive was blocked. Access to the project site would occur from existing roadways that would not be changed as part of the project. The construction of an emergency vehicle access point at the Westbridge cul-de-sac, would reduce impacts to a less than significant level by ensuring the fire department can provide adequate service.

Furthermore, the project description includes the following project design features that would ensure the project site would be adequately served by emergency service providers:

- Unobstructed access will be provided throughout the site.
- Parking will be restricted within the first 50 feet of the project entrances.
- If landscaped medians or other entry treatments are proposed, a 20-foot clear area must be provided.
- If on-street parking is proposed, the street cross-section would be of sufficient width to accommodate parking lanes and maintain a 20-foot clear path of travel.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Public Transit, Bicycles, and Pedestrians

| | |
|---|---|
| **Impact TRANS-7:** | **The project may conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.** |

### *Impact Analysis*

There are no transit or bicycle facilities currently provided near the project site and none are planned to be constructed. No dedicated bicycle facilities are proposed within the project site. Should the bypass road be constructed, it should provide bicycle lanes to connect to the existing bicycle facilities on Sycamore Creek Way.

Currently there are two pedestrian facilities adjacent to the site: the Happy Valley Loop Trail and Golf Course Loop Trail. The Happy Valley Specific Plan identifies the Spotorno Flat Area Trail (number 4 on the HVSP Trails Plan exhibit) within the Spotorno property area. In addition, the HVSP identifies two other trails within the Spotorno property area: the “Bypass Road Trail” (number 3 on the HVSP

Trails Plan exhibit), and the "Spotorno MDR/Foley Ranch Trail connection" (number 7A on the exhibit), which would connect from the Bypass Road trail, to the east. The 1993 Trails Master Plan shows trails along Westbridge Lane, and connecting from Minnie Street (approximately) across the north edge of the Specific Plan area to the east. The 1993 Master Plan shows a range of facility types and designs, ranging from "Class A" regional trails, "Class B" trails that are separated from streets, and "Class C" trails, which are local/connector trails that are typically on-street, with widths ranging from 4 to 8 feet, depending on location and use.

The City is currently undertaking an update to the Trails Master Plan, with adoption expected in late 2018. The April 2018 Public Review Draft of the updated Master Plan further defines these trails to include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect the Spotorno Flat Area to the Foley property to the east, and Lund Ranch. Note that, although the updated Trails Master Plan Update is not yet adopted, it likely will be adopted before the project is considered for approval by the City, and therefore it has been determined appropriate to consider the project for conformance with this document.

The proposed project's site plan identifies a 6-foot-wide trail (4-foot paved with a 2-foot earthen edge) along the proposed Clubhouse Drive extension through the project; a 6-foot wide graded earth trail along Westbridge Lane and Clubhouse Drive where it terminates at the water tank, and a connector from the Callippe Preserve Trail east to the Foley Property boundary. The project does not propose a north-south trail connection through the hillside portion of the property that is equivalent to that shown in the HVSP or April 2018 Public Review Draft Trails Master Plan.

This proposed trail along the Clubhouse Drive extension through the property meets the HVSP standard trail width identified in the Trail Summary Table in the HVSP; however, the April 2018 Public Review Draft of the updated Master Plan requires a trail width of 8 feet, and the existing 1993 Trails Master Plan states that trails up to 8 feet in width may be required, if conditions allow.

General Plan Policy 7, Program 7.3 specifies that new developments should "Design complete streets serving pedestrians, bicyclists, motorists, and transit riders of all ages and abilities, except where infeasible. Complete streets may include: alternative intersection control where appropriate; requiring bicycle and pedestrian connections from cul-de-sacs to adjacent streets, trails, bicycle paths, and neighborhoods; and incorporating appropriate traffic calming measures." Given the context of the project, providing a Class I trail would meet the City's complete streets requirements.

Mitigation Measure TRANS-7 would ensure the proposed trail system, including trail widths and designs would be consistent with the HVSP and Draft Trails Master Plan and that the plan is consistent with General Plan Policy 7, Program 7.3. Therefore, with implementation of Mitigation Measure TRANS-7, the project would not conflict with these documents and impacts would be less than significant.

### *Level of Significance Before Mitigation*

Potentially significant impact.

### *Mitigation Measures*

**MM TRANS-7** Prior to issuance of building permits, the project applicant shall submit site plans that would be consistent with the intent of the planned network shown in the Draft Trails Master Plan and Happy Valley Specific Plan, including one or more north-south connections through the project, or an alternative trail connection determined by the City to be equivalent, to that connection. All trails shall be designed as required for the applicable facility type in the Draft Trails Master Plan. Show all proposed trail designs are consistent with the Trails Master Plan. The site plans shall show that pedestrian and bicycle connections are provided from cul-de-sacs to adjacent streets where applicable, such as at the new Westbridge Lane cul-de-sac, and there are no conflicts with General Plan Policy 7, Program 7.3. In addition, trail construction shall be completed prior to issuance of occupancy permits.

### *Level of Significance After Mitigation*

Less than significant impact.

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# 3.13 - Tribal Cultural Resources

## 3.13.1 - Introduction

This section describes the existing Tribal Cultural Resources (TCRs) setting and potential effects from project implementation on the site and its surrounding area. Conclusions are based on initial consultation with the Native American Heritage Commission (NAHC) and subsequent consultation with tribal representatives identified by the NAHC who may have interest in or additional information on TCRs that may be impacted by project development. Copies of all consultation conducted by FirstCarbon Solutions (FCS) and the City of Pleasanton may be found in Appendix D. The review presents the methods employed to identify TCRs, assesses potential impacts to those resources, and presents recommendations to address potential impacts.

## 3.13.2 - Regulatory Framework

### State

#### *California Assembly Bill 52*

Assembly Bill 52 (AB 52) was signed into law on September 25, 2014, and provides that any public or private "project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment." Tribal Cultural 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." Under prior law, Tribal Cultural Resources were typically addressed under the umbrella of "cultural resources," as discussed above. AB 52 formally added the category of "tribal cultural resources" to CEQA, and extends the consultation and confidentiality requirements to all projects, rather than just projects subject to SB 18 as discussed above.

The parties must consult in good faith, and consultation is deemed concluded when either: (1) the parties agree to measures to mitigate or avoid a significant effect on a tribal cultural resource (if such a significant effect exists); or (2) when a party concludes that mutual agreement cannot be reached. Mitigation measures agreed upon during consultation must be recommended for inclusion in the environmental document. AB 52 also identifies mitigation measures that may be considered to avoid significant impacts if there is no agreement on appropriate mitigation. Recommended measures include:

- Preservation in place
- Protecting the cultural character and integrity of the resource
- Protecting the traditional use of the resource
- Protecting the confidentiality of the resource
- Permanent conservation easements with culturally appropriate management criteria.

## 3.13.3 - Methodology

### NAHC Sacred Lands File Record Search and Tribal Consultation

On January 30, 2018, FCS sent a letter to the NAHC in an effort to determine whether any sacred sites are listed on its Sacred Lands File for the project area. A response was received on March 1, 2018 indicating that the Sacred Lands File did not indicate the presence of Native American cultural resources in the immediate project area. The NAHC included a list of six tribal representatives available for consultation. To ensure that all Native American knowledge and concerns over potential TCRs that may be affected by the project are addressed, a letter containing project information and requesting any additional information was sent to each tribal representative on March 6, 2018. No responses have been received to date.

## 3.13.4 - Thresholds of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, tribal cultural resources impacts resulting from the implementation of the proposed project would be considered significant if the project would 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 the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a. 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

b. 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 Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR did not evaluate Tribal Cultural Resources because this analysis was not a requirement at the time the FEIR was certified. Therefore, no mitigation measure was required. The following section evaluates potential impacts of the project as currently proposed.

## 3.13.5 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the construction and operation and provides feasible mitigation measures where appropriate.

## Tribal Cultural Resource Impacts

| | |
|---|---|
| **Impact TCR-1:** | **The project would not cause a substantial adverse change in the significance of a tribal cultural resource 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),** |

### *Impact Analysis*

A review of the California Register of Historical Resources, local registers of historic resources, and the NAHC sacred lands file failed to identify any listed TCRs that may be adversely affected by the proposed project. As such, no recorded TCRs will be adversely affected by the proposed project.

### *Level of Significance Before Mitigation*

No impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

No impact.

## Additional Tribal Cultural Resource Impacts

| | |
|---|---|
| **Impact TCR-2:** | **The project would not cause a substantial adverse change in the significance of a tribal cultural 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 Resources Code Section 5024.1.** |

### *Impact Analysis*

Tribal consultation efforts conducted by FirstCarbon Solutions did not identify additional TCRs, and no TCRs meeting the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. have been identified by the City of Pleasanton in its capacity as Lead Agency for the project. As such, no additional significant TCRs will be adversely affected by the proposed project.

### *Level of Significance Before Mitigation*

No impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

No impact.

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# 3.14 - Utilities and Service Systems

## 3.14.1 - Introduction

This section describes the existing utility and service systems setting and potential effects from the implementation of the project and its surroundings. Descriptions and analysis in this section are based on information contained in the City of Pleasanton General Plan (General Plan), General Plan EIR, East Pleasanton Specific Plan, and City of Pleasanton 2015 Urban Water Management Plan, the Happy Valley Water & Sewer Technical Memorandum (RMC 2016) (Appendix K), and the Water Distribution System Master Plan Update (CDM 2004) (Appendix K).

## 3.14.2 - Environmental Setting

### Potable Water

As a water retailer, the City of Pleasanton provides potable water service to businesses and homes within the City as well as adjacent, unincorporated areas, including Kilkare Woods, Remen tract, portions of unincorporated Foothill Road, and other isolated service areas. The City of Pleasanton has two water supply systems: purchased or imported water from Zone 7 and groundwater. The water distribution system consists of over 300 miles of pipelines ranging from 4 to 36 inches in diameter. The Pleasanton Utilities Division operates 15 water booster pump stations throughout the City. In addition, there are three groundwater well pump stations, which are used to augment the Zone 7 supply. The Utilities Division also operates 10 fluoridation treatment sites. Twenty-one storage reservoirs, varying in size from 20,000 gallons to just under 8,000,000 gallons are spread throughout the City.[1]

In November 2004, Camp Dresser & McKee Inc. (CDM) completed a Water Distribution System Master Plan Update (Master Plan Update) to identify necessary improvements to the City of Pleasanton's water system to meet current and future customer needs through buildout. The Master Plan includes the Happy Valley area. The Master Plan Update determined that the City has adequate infrastructure to serve the project site, and that the North Sycamore Pump Station (PS), which would serve the project site, has a total capacity of 5.8 million gallons per day.

### *Zone 7 Water Agency*

*Service Area*

Zone 7 of the Alameda County Flood Control and Water Conservation District (Zone 7 Water Agency or Zone 7) distributes its water supplies to cities, water retailers, and unincorporated areas within the Tri-Valley area. Zone 7 serves the cities of Pleasanton, Dublin, Livermore, and southern portions of San Ramon through four retail water suppliers: the City of Pleasanton, Dublin-San Ramon Services District, City of Livermore, and California Water Service Company of Livermore. Zone 7 and its water retailers serve a population of approximately 245,000.[2]

[1] City of Pleasanton 2005 General Plan 2025 DEIR, Utilities, "Regional Water Supply", pages 3.5-1–3.5-4, 2008.
[2] Zone 7 Water Agency "Service Area" Website: http://www.zone7water.com/about-us/service-area. Accessed February 10, 2017.

*Water Supply*

Zone 7 derives its water from three sources: State Water Project, water from the South Bay Aqueduct, surface runoff collected in the Del Valle Reservoir, and local groundwater. In addition to water stored in the local groundwater basin, Zone 7 has acquired additional out-of-basin groundwater storage to help supply its service area during droughts. Water delivered to Pleasanton comes primarily from the State Water Project.[3]

*Distribution System*

California pumps State Water Project water from the Sacramento-San Joaquin Delta via the California Aqueduct and conveys it to the Valley via the South Bay Aqueduct. Zone 7 treats this imported water at its Patterson Pass and Del Valle Water Treatment Plants in Livermore, and then sends it to Pleasanton via the Zone 7 Cross Valley and Vineyard Pipelines. Zone 7 also stores water from the State Water Project and from local runoff in the Del Valle Reservoir and uses this water to replenish groundwater supplies through release into the Arroyo del Valle and Arroyo Mocho. Zone 7 also uses this water as a secondary local supply to its two water treatment plants.[4]

### *City of Pleasanton Groundwater Wells*

Pleasanton's annual groundwater entitlement is 3,500 acre-feet. Groundwater is pumped from the City of Pleasanton groundwater wells generally during the summer months to meet peak-usage periods. Groundwater is disinfected through the use of chloramines (a combination of chlorine and ammonia) prior to being pumped into the City's water system.[5]

### *Urban Water Management Plan Projections*

The City of Pleasanton 2015 Urban Water Management Plan (UWMP) provides a comparison of demand and supply under various scenarios through the year 2030 and summarizes the water supply projections (Table 3.14-1). Zone 7 maintains a 100-percent reliability policy for existing development for the next 20 years through average, single dry, and multiple dry years; therefore, the demand is equivalent to the supply provided.[6]

[3] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Water Systems" page 8–9, 2009.
[4] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Water Supply" page 8–9, 2009.
[5] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Water Supply" page 8–11, 2009.
[6] 2015 Urban Water Management Plan City of Pleasanton Chapter 7, "Water Supply Reliability Assessment" page 7–1.

## Table 3.14-1: Projected Retail Water Supplies

| Water Supply | Additional Detail on Water Supply | Projected Water Supply (report to the extent practicable) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 2020 | | 2025 | | 2030 | | 2035 | | 2040 (optional) | |
| | | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) | Reasonably Available Volume | Total Right or Safe Yield (optional) |
| Purchased or Imported Water | Zone 7 | 12,442 | — | 13,200 | — | 14,005 | — | 14,867 | — | 15,764 | — |
| Groundwater | Livermore Valley Basin | 3,500 | — | 3,500 | — | 3,500 | — | 3,500 | — | 3,500 | — |
| Recycled Water | DSRSD RWTF and City of Livermore WRP | 1,800 | — | 1,800 | — | 1,800 | — | 1,800 | — | 1,800 | — |
| **Total** | | 17,742 | — | 18,500 | — | 19,305 | — | 20,167 | — | 21,064 | — |

Note:
Volumes are in ATF
Source: Table 6-11, City of Pleasanton 2015 Urban Water Management Plan.

Zone 7 evaluates and pursues new water supply options, including potable reuse, which would maximize reuse of locally generated wastewater. Zone 7 also continues to support the expansion of recycled water use for irrigation. Additional supplies from reuse would reduce the percentage of Zone 7's water supply derived from imported water supplies. Optimization and expansion of local storage options allow Zone 7 to minimize use of imported water supplies, when necessary, during droughts. Zone 7 is a member of the Bay Area Regional Reliability Partnership, bringing together nine Bay Area agencies aiming to improve regional supply reliability.[7]

## Recycled Water

The City has two sources of recycled water: the Dublin San Ramon Services District (DSRSD) and the City of Livermore. The DSRSD's Recycled Water Treatment Facility (RWTF) currently treats the City's wastewater flows and would provide the majority of the City's recycled water after installation of recycled water delivery infrastructure. The recently completed Phase 1 tertiary treatment expansion added a total of 2 million gallons per day (mgd) of recycled water supply, and the planned second phase will result in another 2 mgd of recycled water for a total of 4 mgd (WJM C&E 2014). The second source of recycled water is the City of Livermore. Pleasanton and Livermore have an agreement for Livermore to provide recycled water supplies to help meet the recycled water demands on the east side of the City of Pleasanton (WJM C&E 2014).

## Wastewater

Three agencies handle the collection, treatment, and disposal of wastewater within the City of Pleasanton. The City of Pleasanton provides its own sewage collection facilities within in the city limits. The DSRSD provides sewage treatment services under contract with the City. The Livermore-Amador Valley Water Management Agency (LAVWMA)—a joint powers agency between Pleasanton, Livermore, and DSRSD—provides export/treated sewage disposal services for treated sewage effluent.[8]

### *City of Pleasanton Collection System*

The City of Pleasanton owns, operates, and maintains a wastewater collection system within the City's boundaries. Total pipeline length within the service area exceeds 250 miles and consists of local and trunk sewer pipes, ranging in size from 4 to 42 inches in diameter. In addition to numerous sewer mains and collectors, four major trunk sewers are tributary to the wastewater treatment plant and the ten pump stations in the system. Pleasanton's sewer flows include sewage from the Castlewood area, but do not include sewage from the Ruby Hill area. Under contract with the City of Pleasanton, the City of Livermore treats Ruby Hill wastewater flows. Based on preliminary results of the Wastewater Collection System Master Plan, the City's sewage collection system is adequate for current flows. The major trunk lines included in the City's past Wastewater Collection System Master Plan are in place and are sized appropriately to accommodate existing flows. However, the City has identified the need for some improvements to the existing collection and pumping system.

In 2016, RMC completed a Water and Sewer Study for the Happy Valley Specific Plan Area (Water and Sewer Study) to evaluate whether improvements would be needed to the existing water and

[7] 2015 Urban Water Management Plan City of Pleasanton Chapter 7, "Water Supply Reliability Assessment" page 7–12.
[8] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Wastewater" page 8–15, 2009.

sewer facilities within the unincorporated portion of the Happy Valley Specific Plan (HVSP) area; to identify the new facilities that would be needed to serve the future Happy Valley residents and to estimate the capital costs of these improvements. Exhibit 3.14-1and Exhibit 3.14-2 depict the proposed water system and sewer system improvements. The study determined that between 5.35 to 5.75 million dollars in capital improvements consisting of pressurized pipelines, hydrants, pressure relief values, pump station, force mains, and gravity sewer lines would be required to serve the Happy Valley Area.[9]

### *DSRSD Wastewater Treatment*

The Dublin-San Ramon Services District (DSRSD) provides wastewater treatment services to the City of Pleasanton under a number of wastewater treatment and disposal contracts between the two agencies. The DSRSD Regional Wastewater Treatment Facility (RWTF) is located immediately southeast of the Interstate 680/Stoneridge Drive interchange. It provides primary, secondary, and tertiary wastewater treatment. The RWTF recently completed an expansion project to bring the average dry-weather wastewater-flow design capacity from 11.5 mgd of wastewater treatment capacity to 17 mgd. The City of Pleasanton is currently entitled to half of this treatment capacity, or 8.5 mgd.

### *Livermore-Amador Valley Wastewater Management Agency Wastewater Disposal*

LAVWMA exports treated water from the DSRSD RWTF. The facilities consist of storage/flow equalization reservoirs, a large pumping station, and a pipeline to convey the treated wastewater across the Dublin Grade along Interstate 580 to the west where it is de-chlorinated by the East Bay Discharge Authority facility before flowing to the San Francisco Bay. LAVWMA receives treated water from the City of Livermore and the DSRSD. LAVWMA facilities are designed to export a maximum flow of 41.2 mgd during wet weather events. The LAVWMA export system is believed to be adequate to serve Pleasanton's planned General Plan buildout, including development of the Happy Valley Specific Plan Area.[10]

## Storm Drainage

The City of Pleasanton along with several other agencies in Alameda County are permittees of the Alameda Countywide Clean Water Program. The City also operates under the San Francisco RWQCB's Municipal Regional Permit (MRP).

Under the existing condition, the natural drainage of the project site is predominately covered with vegetation and tall grasses. The City of Pleasanton owns and maintains drainage facilities within the City limits consisting of underground pipes, local channels, and natural swales in hillside areas. These facilities carry water runoff within the drainage basin to the flood-control channels (known locally as arroyos). Existing stormwater drainage infrastructure runs along Alisal Street and Westbridge Lane but does not cross into the project boundaries. According to the HVSP, limited flooding occurs during winter storms along Alisal Street at a low point along the Faith Chapel Assembly of God frontage caused by an undersized street culvert. In addition, cross-road flooding occurs at the south end of Alisal Street as well as along Happy Valley Road just west of Alisal Street. To

[9] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Wastewater" page 8–16, 2009.
[10] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Export System" page 8–19, 2009.

accommodate future buildout of the HVSP, the City requires new developments to install appropriately sized storm drains and detention systems.[11]

## Solid Waste

Solid waste collection and disposal services in Pleasanton are provided by the Pleasanton Garbage Service (PGS). PGS provides solid waste collection services under an exclusive franchise agreement with the City of Pleasanton. These services include collection of solid waste from commercial, industrial, and residential customers within the City. Collected solid waste is sorted at the Pleasanton Transfer Station and Recycling Center, which is also operated by PGS. The Pleasanton Transfer Station and Recycling Center has a design capacity of 720 tons per day.

## Landfill Capacity

PGS transports solid waste to the Vasco Road Sanitary Landfill in Livermore, which has a daily permitted capacity of 2,518 tons/day (CalRecycle 2016). According to the Alameda County Integrated Waste Management Plan, and assuming achievement of countywide waste reduction goals, the Vasco Road Landfill will have capacity through 2022 (CalRecycle 2016).

**Table 3.14-2: Landfill Summary**

| Landfill | Location | Maximum Daily Throughput | Remaining Capacity | Closure Date |
|---|---|---|---|---|
| Vasco Road Sanitary Landfill | Livermore | 2,518 tons | 7.9 million cubic yards | 2022 |
| Source: CalRecycle 2016. | | | | |

## Energy

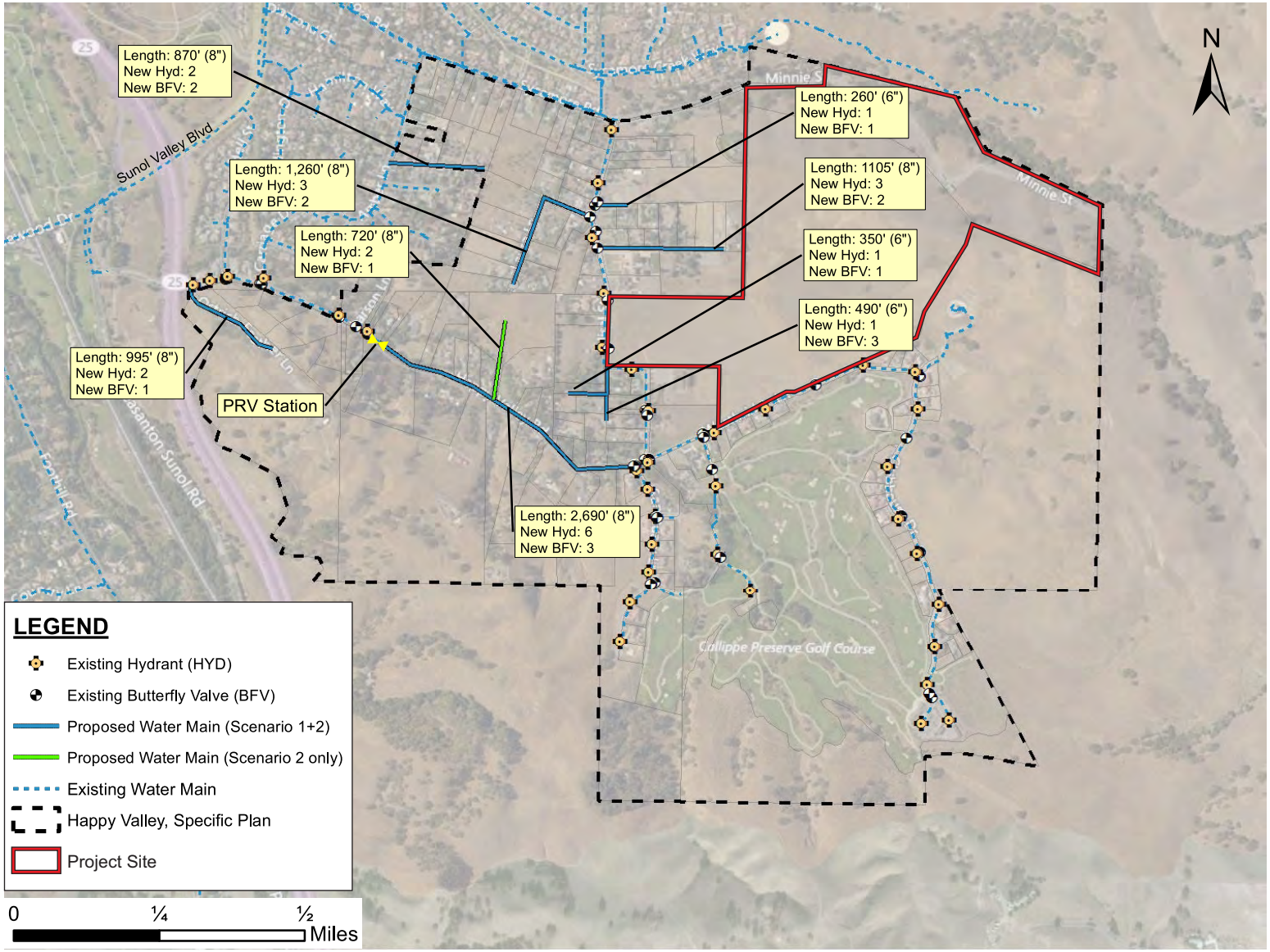
Pacific Gas and Electric Company (PG&E) provides electricity and natural gas service to the City of Pleasanton and the project site. Below is a discussion of each energy source.

### *Electricity*

PG&E provides electricity service to all or part of 47 counties in California, including Alameda County, constituting most of the northern and central portions of the State. PG&E-owned generating facilities include nuclear, fossil fuel, hydroelectric, and solar with a net generating capacity of more than 7,300 megawatts.

PG&E implemented a transmission capacity increase project in the Tri-Valley area in 2002. In Pleasanton, this project included the installation of a new, underground, 230-kilovolt, high-voltage line near Vineyard Avenue and upgraded the existing Vineyard Substation to accommodate the increased electrical capacity. In light of these capacity increase improvements, it is expected that the provision of electricity to future project site developments can be reasonably achieved.[12]

[11] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, “Storm Drainage” page 8–21, 2009.
[12] City of Pleasanton 2005 General Plan 2025 Chapter 10 Energy Element, “Tri-Valley Capacity-Increase Project” page 10–3, 2009.




Source: RMC Water and Environment, May 2016.

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Exhibit 3.14-1
Proposed Water System Improvements

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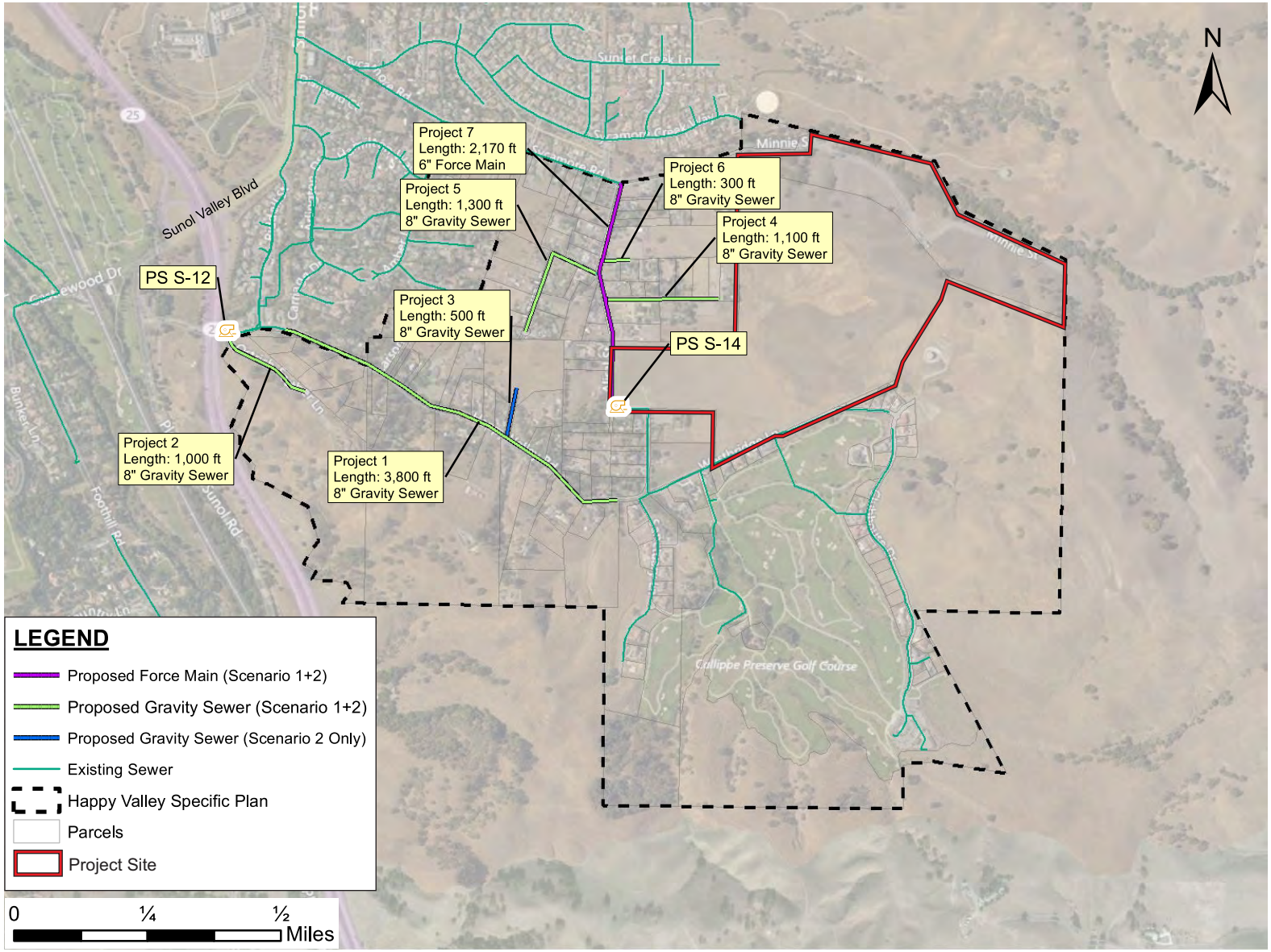


Source: RMC Water and Environment, May 2016.

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Exhibit 3.14-2
Proposed Sewer System Improvements

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### *Natural Gas*

PG&E provides natural gas service to all or part of 39 counties in California, including Alameda County, constituting most of the northern and central portions of the State. Natural gas transmission pipelines in the immediate vicinity of the project site are located within the northern portion of Sunol Boulevard right of way, extending northward on to First Street and consequently to Stanley Boulevard. It is expected that the provision of future natural gas to the project site can be reasonably achieved.[13]

## 3.14.3 - Regulatory Framework

### Federal

### *Clean Water Act*

The Federal Water Pollution Control Act of 1972, more commonly known as the Clean Water Act (CWA), regulates the discharges of pollutants into watersheds throughout the nation. Under the CWA, the United States Environmental Protection Agency (EPA) implements pollution control programs and sets wastewater treatment standards.

### *National Pollutant Discharge Elimination System*

Municipal stormwater discharges in the Alameda County are regulated under the San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit No. CAS612008, Order No. R2-2009-0074, adopted October 14, 2009. The Municipal Regional Permit is overseen by the Regional Water Board. The City of Pleasanton is a permittee of the Alameda Countywide Clean Water Program.

The Clean Water Program is an association of the agencies in Alameda County that manage separate storm drain systems and creek channels that discharge urban runoff to San Francisco Bay. The Clean Water Program has 17 member agencies: the 14 cities in the County, Unincorporated Alameda County, Zone 7 Water Agency, and the Alameda County Water Conservation and Flood Control Division.[14]

Provision C.3 of the permit addresses post-construction stormwater management requirements for new development and redevelopment projects that add and/or replace 10,000 square feet or more of impervious area. Provision C.3 requires the incorporation of site design, source control, and stormwater treatment measures into development projects in order to minimize the discharge of pollutants in stormwater runoff and non-stormwater discharges and to prevent increases in runoff flows. Low Impact Development methods are to be the primary mechanism for implementing such controls.

### State

### *California Green Building Standards Code*

The California Green Building Standards Code was adopted January 12, 2009. Updates to the Code for 2016 went into effect on January 1, 2017. The purpose of this code is to improve public health, safety, and general welfare by enhancing the design and construction of buildings through the use of

[13] City of Pleasanton 2005 General Plan 2025 Chapter 10 Energy Element, "Transmission and Distribution of Natural Gas" page 10–3, 2009.
[14] Alameda Countywide Clean Water Program, Chapter 1, page 1–2, April 2016.

building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories:

- Planning and design
- Energy efficiency
- Water efficiency and conservation
- Material conservation and resource efficiency
- Environmental air quality

The Code addresses exterior envelope (exterior building walls), water efficiency, and material conservation components to reduce energy usage and help meet water use reductions contemplated by AB 32.

### *California Urban Water Management Planning Act*

The Urban Water Management Planning Act (California Water Code Sections 10610-10656) requires that all urban water suppliers with at least 3,000 customers prepare urban water management plans and update them every five years. The act requires that urban water management plans include a description of water management tools and options used by that entity to maximize resources and minimize the need to import water from other regions.

The City of Pleasanton's Urban Water Management Plan was last updated in 2015 and includes projections of water demand and supply through 2040.

### *Model Water Efficient Landscape Ordinance*

The Model Water Efficient Landscape Ordinance was adopted by the Office of Administrative Law in September 2009 and requires local agencies to implement water efficiency measures as part of their review of landscaping plans. Local agencies can either adopt the Model Water Efficient Landscape Ordinance or incorporate provisions of the ordinance into code requirements for landscaping. For new landscaping projects of 2,500 square feet or more that require a discretionary or ministerial approval, the applicant is required to submit a detailed "Landscape Documentation Package" that discusses water efficiency, soil management, and landscape design elements.

### *California Integrated Waste Management Act*

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the State Legislature passed Assembly Bill (AB) 939, the California Integrated Waste Management Act of 1989. The legislation required each local jurisdiction in the State to set diversion requirements of 25 percent by 1995 and 50 percent by 2000; established a comprehensive statewide system of permitting, inspections, enforcement, and maintenance for solid waste facilities; and authorized local jurisdictions to impose fees based on the types or amounts of solid waste generated. In 2007, Senate Bill (SB) 1016, Wiggins, Chapter 343, Statutes of 2008, introduced a new per capita disposal and goal measurement system that moves the emphasis from an estimated diversion measurement number to using an actual disposal measurement number as a per capita disposal rate factor. As such, the new disposal-based indicator (pounds per person per year) uses only two factors: a jurisdiction's population (or in some cases employment) and its disposal as reported by disposal facilities.

## Measure D—the Alameda County Source Reduction and Recycling Initiative

### *California Public Utilities Commission*

The California Public Utilities Commission (CPUC) regulates privately owned telecommunication, electric, natural gas, water, railroad, rail transit, and passenger transportation companies. It is the responsibility of the CPUC to (1) assure California utility customers safe, reliable utility service at reasonable rates; (2) protect utility customers from fraud; and (3) promote a healthy California economy. The Public Utilities Code, adopted by the legislature, defines the jurisdiction of the CPUC.

### *Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings*

Title 24, Part 6, of the California Code of Regulations establishes California's Energy Efficiency Standards for Residential and Nonresidential Buildings. The standards were most recently updated in 2016, which went into effect on January 1, 2017.

For purposes of reference, single-family homes built to the 2016 standards will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards. In 30 years, California will have saved enough energy to power 2.2 million homes, reducing the need to build 12 additional power plants.

## Local

### *City of Pleasanton*

*General Plan*

The Pleasanton General Plan sets forth the following goals, policies, and programs related to utilities and service systems.

**Public Facilities and Community Programs Element**

- **Goal 10:** Strive to meet or exceed State and County standards for source reduction and waste diversion, including the countywide goal of 75 percent reduction of waste going to landfills by 2010.
  - **Policy 26:** Minimize the City's generation of solid waste materials by supporting the Alameda County Integrated Waste Management Plan and Source Reduction and Recycling Plan and by developing City recycling programs using the California Diversion rate methodology for measurement.
    - **Program 26.1:** Continue to promote the recycling of materials at the solid waste transfer station and other locations.
    - **Program 26.2:** Recycle paper, glass, metal, and other marketable materials through the City's centralized recycling program.
    - **Program 26.4:** Promote incentives for using recycled materials in construction or manufacturing.
    - **Program 26.6**: Promote and provide incentives for using recycled materials in the home or business.
    - **Program 26.8:** Promote and provide incentives for the reduction of curbside waste.
    - **Program 26.9:** Utilize waste management reclamation methods to the fullest extent feasible.

- **Program 26.10:** Continue to support the green waste composting program.
- **Program 26.18:** Residential projects with more than three units and all non-residential projects in the city shall prepare and implement a Project Waste Diversion Plan that includes a discussion of the project's diversion strategies. The plan shall include a description of onsite disposal, composting and recycling facilities, a construction debris disposal and recycling plan, and a discussion of any pre-waste stream conservation measures appropriate to the project. The City shall review and approve waste diversion plans as part of the land entitlement process for projects.

**Water Element**

- **Goal 4:** Provide sufficient water supply and promote water safety and security.
  - **Policy 4:** Ensure an adequate water system and a high quality water supply for existing and future development, and maintain an adequate reserve of water in storage facilities.
    - **Program 4.1:** Require new development to pay for its fair share of the City's water system master plan improvements.
    - **Program 4.2:** Develop a contingency plan for potential water shortages including groundwater management and water conservation.
    - **Program 4.3:** Work with Zone 7 to establish and monitor acceptable ranges of underground water levels and recharge when necessary.
    - **Program 4.4:** Maintain sufficient water pressure to serve residential, commercial, industrial, and fire-flow requirements as determined by the City Engineer.
    - **Program 4.10:** Continue to work with Zone 7 to ensure that use of the groundwater basin by Zone 7 does not result in deterioration of water quality.
- **Goal 5:** Provide adequate sewage treatment and minimize wastewater export.
  - **Policy 5:** Secure sewage capacity through all available means for residential, commercial, and industrial development.
    - **Program 5.1:** Require new development to pay its fair share of the City's planned sewer system improvements including treatment, distribution, reuse, and export facilities.
  - **Policy 6:** Approve only those sewage collection, treatment, and export expansion alternatives which are cost- and energy-efficient and do not create a health hazard.
    - **Program 6.1:** Utilize wastewater reuse/reclamation methods to the fullest extent financially and environmentally feasible. Identify additional parks, playgrounds, and non-residential landscaping where recycled tertiary treated wastewater could be used without negatively impacting groundwater (e.g., with salt buildup). Encourage new parks and non-residential landscaped areas to use recycled wastewater whenever feasible, safe, cost-effective, and nonpolluting. Encourage new and retrofitted commercial uses to utilize recycled wastewater for landscaping and toilets, whenever feasible, safe and nonpolluting.
  - **Policy 7:** Support cost-effective and environmentally sensitive approaches to wastewater reuse in the Tri-Valley.
    - **Program 7.1:** Work with Zone 7 and other water, wastewater, business, and planning agencies to support cost effective and environmentally sensitive approaches to Tri-Valley wastewater reuse.
- **Goal 6:** Minimize stormwater runoff and provide adequate stormwater facilities to protect property from flooding.

- **Policy 8:** Ensure an adequate storm drainage system to serve existing and future development.
  - **Program 8.1:** Require new development to pay its fair share of the storm drainage system improvement costs.
  - **Program 8.2:** Design local storm drainage improvements to carry appropriate design-year flows resulting from buildout of the General Plan.
  - **Program 8.3:** Work with Zone 7 to complete planned, regional storm drainage improvements.
  - **Program 8.4:** As determined by the City Engineer, require new development to improve local storm drainage systems to accept appropriate design-year flows resulting from new development.

- **Goal 7:** Reduce stormwater runoff and maximize infiltration of naturally-occurring rainwater so as to improve surface and subsurface water quality.
  - **Policy 10:** Encourage a built environment that minimizes impervious surfaces.
    - **Program 10.1:** Review development plans to minimize impervious surfaces and generally maximize infiltration of rainwater in soils, where appropriate. Maximize permeable areas to allow more percolation of runoff into the ground through such means as biofilters, green strips, planter strips, decomposed granite, porous pavers, swales, and other water-permeable surfaces. Require planter strips between the street and the sidewalk within the community, wherever practical and feasible.
    - **Program 10.2:** Maximize the runoff directed to permeable areas or to stormwater storage by (1) orienting roof runoff towards permeable surfaces or drains, (2) grading the site to divert flow to permeable areas, (3) using cisterns, retention structures, or green rooftops to store precipitation for reuse, and (4) designing curbs and berms so as to avoid isolating permeable or landscaped areas.
    - **Program 10.3:** Encourage design and construction of new streets to be the minimum width possible while still meeting all circulation, flow, and safety requirements. Encourage parking pullouts adjacent to landscaping and pervious surfaces, where practical and feasible.
    - **Program 10.5:** Discourage additional parking over and above required minimum parking standards for any land use, unless the developer can demonstrate a need for additional parking.
    - **Program 10.7:** Create a vegetative buffer between streambeds and development. Developers should retain existing vegetation and, where necessary, plant these buffers with native plant species.
  - **Policy 11:** Implement stormwater runoff requirements, as required by the State Regional Water Quality Control Board and the Alameda County-wide Clean Water Program, with as little impact on development and business costs as possible.
    - **Program 11.1:** Incorporate conditions of approval developed by the Alameda County-wide Clean Water Program, as appropriate, for new development and discretionary permits.
    - **Program 11.2:** Develop design guidelines and standard details to enable developers to incorporate clean water runoff requirements into their projects.
    - **Program 11.3:** Using the California Environmental Quality Act (CEQA) process, evaluate the development effects on stormwater runoff.

- **Program 11.4:** Encourage site planning and design techniques to minimize water-quality impacts, including minimizing land disturbance, minimizing impervious surfaces, clustering development, preserving open space, and maintaining riparian areas with buffer zones to reduce runoff into waterways.
- **Program 11.6:** Require use of Best Management Practices for construction activities and ongoing business operations to prevent contaminants from entering the storm drain system.

**Energy Element**

- **Goal 1:** Move toward a sustainable energy future that increases renewable energy use, energy conservation, energy efficiency, energy self-sufficiency, and limits energy-related financial burdens in Pleasanton.
  - **Policy 7:** Promote renewable energy.
    - **Program 7.5:** For new construction, require roofs that are strong enough and have roof truss spacing to hold photovoltaic panels, where feasible and cost effective.
    - **Program 7.6:** Require solar water heating and/or photovoltaic-ready roofs in new construction, i.e., roofs with wiring installed for a roof-mounted photovoltaic system, where feasible.

*Pleasanton Municipal Code*

The Pleasanton Municipal Code includes regulations regarding water under Title 14, including regulation of water system and water service fees, water connections, and regulations for protection from water contamination. Title 15 of the Pleasanton Municipal Code establishes standards and conditions related to the use and management of the City of Pleasanton sewer transmission system.

Under Municipal Code Section 9.21, the submittal of a Waste Management Plan to the City is required prior to the issuance of a building, demolition, or similar permit. The Waste Management Plan must identify the volume of construction and demolition materials to be generated, the percentage that will be diverted, the percentage to be placed in landfill, and the debris collector/recycler. Review of this application by the City ensures development projects assist the City in meeting accepted diversion rates consistent with the City's Source Reduction and Recycling Plan.

*Pleasanton Water Efficient Landscape Ordinance*

The City of Pleasanton adopted a local version of the state Water Efficient Landscape Ordinance, which is more stringent than the State's Model Water Efficient Landscape Ordinance. The ordinance applies to new and rehabilitated landscapes for all new and existing public and private development with equal to or greater than 2,500 square feet and is designed to conserve and promote the efficient use of water. The ordinance establishes a structure for the planning, designing, installing, maintaining and managing of the landscape of new and rehabilitated projects.

## 3.14.4 - Methodology

FirstCarbon Solutions evaluated impacts on utilities and service systems through, among other data and materials, review of the City of Pleasanton General Plan, City of Pleasanton 2015 Urban Water Management Plan, Dublin San Ramon Services District Fact sheet, and site plans. In 2016, RMC completed a Water and Sewer Study for the Happy Valley Specific Plan Area to evaluate whether

improvements would be needed to the existing water and sewer facilities; to identify the new facilities that would be needed to serve the future Happy Valley residents and to estimate the capital costs of these improvements. This Study was also reviewed and relevant information from this Study was included and is included as Appendix K. In addition, agency websites were reviewed for relevant information about facilities and services provided.

## 3.14.5 - Thresholds of Significance

According to the CEQA Guidelines' Appendix G Environmental Checklist, to determine whether impacts to utilities and service systems are significant environmental effects, the following questions are analyzed and evaluated.

Would the project:

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

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

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?

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

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

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

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

h) Result in the inefficient, wasteful, or unnecessary use of energy?

### Happy Valley Specific Plan Final EIR

As discussed in Section 2, Project Description, the HVSP was adopted by the City in 1998. A Final EIR (FEIR) was prepared to analyze the impacts from adopting the Plan (State Clearinghouse No. 97032034; June 16, 1998). The HVSP FEIR evaluated project impacts in relation to utilities and found that the project would have a potentially significant impact on utilities without mitigation.

Appendix J provides a list of mitigation measures from the HVSP FEIR. As shown in Appendix J, Mitigation Measure E1 through E6, G2, G3, and G6 through G11 would not be applicable. These mitigation measures, applicable to the HVSP for utilities and services systems, will be carried forward as Conditions of Approval for the Spotorno Ranch Project.

The project would develop fewer units than were envisioned in the HVSP. The 75 lots that were proposed for the Spotorno Upper Valley Area would no longer be developed, which would lessen the impacts to utilities and service systems of the project as a whole. The project also proposes elimination of the Bypass Road, which would avoid impacts associated with its construction and operation as envisioned in the HVSP FEIR. Therefore, the project would not introduce new environmental impacts or create more severe environmental impacts than those analyzed in the HVSP FEIR in relation to utilities and service systems. The following section evaluates potential impacts of the project as currently proposed and identifies new mitigation measures, where needed.

## 3.14.6 - Project Impacts and Mitigation Measures

### Wastewater Treatment Requirements

**Impact USS-1: The proposed project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.**

#### *Impact Analysis*

This project could have a significant impact if it creates wastewater that exceeds the wastewater treatment requirements of the San Francisco Bay Regional Water Quality Control Board (RWQCB) established by Order R2-2017-0017 NPDES Permit No. CA0037613, Waste Discharge Requirements and Master Reclamation Permit for the DSRSD, LAVWMA, and the East Bay Dischargers (EBDA). Wastewater from the project would be conveyed to the DSRSD RWTF for treatment and then exported to the LAVWMA system where it is conveyed to EBDA before being released into the San Francisco Bay. Wastewater from the project would consist mostly of effluent typical of the 39 proposed residential units and as such would not substantially increase pollutant levels in the wastewater or exceed RWQCB standards. Further discussion of the amount of effluent generated from this project is discussed in Impact-2. The project does not propose any industrial or commercial use where pollutant levels or wastewater volumes are typically high. Therefore, the project would not exceed wastewater treatment requirements established by the San Francisco Bay RWQCB. As a result, impacts would be less than significant.

#### *Level of Significance Before Mitigation*

Less than significant impact.

#### *Mitigation Measures*

No mitigation is necessary.

#### *Level of Significance After Mitigation*

Less than significant impact.

## Water or Wastewater Treatment Facilities

**Impact USS-2: The proposed project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.**

### *Impact Analysis*

A significant impact would occur if the project would require or result in the construction of new water facilities or expansion of existing facilities that could cause significant environmental effects. This analysis will evaluate capacity at facilities and infrastructure separately.

*Capacity*

The Pleasanton 2005 General Plan 2035 estimates that the average household size is 2.72 persons per household. Using that estimate, the project is expected to generate 107 new residents who would use approximately 16.60 acre-feet of water a year (afy). This projected water use would be less than one percent of the City of Pleasanton's projected water use of 17,742 afy in 2020. In addition, the projected water usage of 15,087 gpd for the proposed project would be within the threshold previously discussed in the HVSP DEIR. As a result, the project would not result in impacts related to potable water supply beyond those previously analyzed in the HVSP DEIR. Therefore, the project would not require the construction of new water facilities.

A significant impact would occur if the project would not be served by a wastewater treatment plant with an adequate capacity or would require the construction of new or expanded facilities. The RWTF recently completed an expansion project to bring the average dry-weather wastewater-flow design capacity from 11.5 mgd of wastewater treatment capacity to 17 mgd. The City of Pleasanton is currently entitled to half of this treatment capacity, or 8.5 mgd. The City's average annual wastewater flow is approximately 6.0 mgd, leaving an additional 2.5 mgd of capacity, which is sufficient to serve Pleasanton's planned buildout growth as anticipated in the General Plan.[15]

DSRSD determined that average wastewater flow from single-family residences equated to 328 gallons a day.[16] Under this assumption, the proposed 39 residential units would generate approximately 12,792 gpd of wastewater. As discussed previously, the City of Pleasanton has an average annual wastewater flow of approximately 6.0 mgd, leaving 2.5 mgd of remaining capacity. The 12,792 gpd of wastewater that the proposed project would generate equates to a nominal increase in the City's remaining 2.5 mgd capacity. The additional project wastewater generation would be within the permitted capacity of the DSRSD. Therefore, impacts associated with wastewater treatment capacity would be less than significant.

*Infrastructure*

As mentioned in Section 3.14.2, the North Sycamore PS would serve the project site, and has a total capacity of 5.8 mgd.[17] The project would utilize 15,087 gpd or 0.013 mgd. Therefore, the North

[15] City of Pleasanton 2005 General Plan 2025 Chapter 8 Water Element, "Treatment Plant" page 8–17, 2009.
[16] Dublin San Ramon Services District Fact Sheet. Website: http://www.dsrsd.com/home/showdocument?id=811. Accessed February 22, 2017.
[17] CDM. 2004. City of Pleasanton Water Master Plan Update, page 3–7. November.

Sycamore PS would have ample capacity to serve the project site and impacts would be less than significant.

As mentioned in Section 3.14.2, Environmental Setting, RMC completed a Water and Sewer Study for the unincorporated portion of the Happy Valley Specific Plan Area. Effluent from the project is likely to discharge directly into PS S-14. The project site was assumed to be built with a maximum of 22 units, per the HVSP; however, there is adequate capacity in PS S-14 even under projected project buildout. In addition, the City of Pleasanton's Engineering Department determined that the force main that PS-14 pumps to is adequately sized to accommodate projected flows with the project.[18] Therefore, impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary

### *Level of Significance After Mitigation*

Less than significant impact.

## Storm Drainage

| | |
|---|---|
| **Impact USS-3:** | **The proposed project would not create a need for new or expanded downstream storm drainage facilities.** |

### *Impact Analysis*

The project site consists of mostly undeveloped land and does not include any existing utility infrastructure. Existing water, wastewater, and stormwater infrastructure is located immediately adjacent, within Alisal Street and Westbridge Lane. The construction of new stormwater drainage facilities would connect to existing facilities mentioned above.

Development of the proposed residential units would result in a net increase of impervious surfaces consisting of buildings, paved roadways, and driveways. Increased runoff volume could exceed the capacity of downstream drainage components, causing localized flooding. As discussed previously in Section 3.8 Hydrology, the HVSP noted there were areas in the project vicinity where flooding has been known to occur. However, the City of Pleasanton's Department of Engineering determined that there does not currently appear to be flooding associated with runoff from the Spotorno property and the proposed retention area could accommodate any anticipated runoff from the project.

The proposed project would be served by existing stormwater facilities maintained by the City of Pleasanton. The City's storm drainage system is composed mostly of curb inlets, underground pipes, local channels, and natural swales. Storm drainage pipes varying from 30 to 36-inches would run underground throughout the site and eventually empty into a bio retention area on the western

[18] RMC Water and Environment. 2016. Technical Memorandum, Happy Valley Water & Sewer Study. November 21.

portion facing Alisal Street. Furthermore, there is a 2.01-acre undeveloped parcel (Parcel A) in the western portion of the project site that contains wetlands that would be preserved from development.

The proposed project site would contain five drainage management areas (DMAs). The total bioretention area proposed by the project would amount to approximately 27,732 square feet. DMA 1 includes Lots 15-18 and features on-site bioretention for storm water. DMA 2 spans from Lots 2-14 and 19-39 and features a 36-inch storm drainage pipeline. The bio-retention pond would be connected to an existing 36-inch storm drainage pipe located within Alisal Street. DMA 3, located entirely on Lot 1, contains Best Management Practice (BMP) 3, which is composed of the same features as previously discussed BMPs for DMA 1. DMA 4, located along the proposed Clubhouse Drive in the north side of Parcel A, would contain BMP 4 and is a proposed 234-square-foot bioretention area. DMA 5, located east of project development and where the building restricted area starts, comprises self-treating systems that would feature conserved natural spaces. Under self-retaining areas, a portion of the amount of stormwater runoff that is required to be treated is infiltrated or retained in depressed landscaped areas, or in properly designed areas of pervious paving. The DMAs may feature concave landscaped areas at lower elevations or pervious paving to accept runoff from impervious surfaces.

Sizing factors and design guidelines would be based on the combination flow/volume sizing criteria set forth in the 2015 Alameda County C3 Stormwater Technical Guidance Handbook. The proposed project's landscaping plans feature groundcover and turf to increase infiltration rates and reduce runoff volumes and erosion and sedimentation.

Furthermore, pursuant to the Standard Urban Storm Water Mitigation Plan, the project would be required to implement stormwater BMPs that limit the volume and flow of stormwater to the municipal storm sewer system. Additionally, the project would adhere to the City's Water Efficient Landscape Program, which requires implementation of outdoor irrigation water conservation measures and practices. Therefore, impacts to storm drainage facilities would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Potable Water Supply

**Impact USS-4: The proposed project would be served with adequate water supplies and would not require additional entitlements or the construction or expansion of water facilities.**

### *Impact Analysis*

This analysis will evaluate capacity at facilities and infrastructure separately.

*Capacity*

The City of Pleasanton acts as a water retailer to the City and the project site. The City of Pleasanton has three water supply systems: Purchased or imported water from Zone 7, Groundwater, and Recycled Water. Approximately 80 percent of water supply is purchased from Zone 7 Water Agency, and the remaining approximate 20 percent from three groundwater wells that are owned and operated by the City. Recycled water represents less than one percent of the City's supply.

As discussed in USS-1, the project is expected to generate 107 new residents. Daily per capita water use in 2015 was 141 gallons per capita per day (gcpd).[20] The estimated 107 new residents would use 15,087 gpd, 5,506,755 gallons per year, or 16.60 afy. Actual water volumes for the City in 2015 totaled 11,459 acre-feet and are projected to increase to 17,742 acre-feet in 2020. The projected 16.60 afy from the proposed project represents less than 1 percent of the future water supply for the City of Pleasanton. Thus, the City has adequate supply to provide for the project.

The HVSP estimated that the water demands associated with the residential component (connection of existing housing units plus development of new housing units permitted by the Specific Plan) would total 506,000 gallons per peak day. The projected water usage of 15,087 gpd for the proposed project is within the threshold previously discussed in the HVSP DEIR. In addition, the project would develop fewer units than envisioned in the HVSP DEIR, which would require less water to serve the project site. Therefore, the project would not result in impacts related to potable water supply beyond those previously analyzed in the HVSP DEIR.

The project's future water requirements would represent a nominal percentage increase in the City's estimated future water demand. All future scenarios analyzed in the UWMP, including the project's water requirements, would be met through a combination of existing and planned entitlements and impacts related to capacity at facilities would be less than significant.

*Infrastructure*

As described in Impact USS-2, the North Sycamore PS would serve the project site, and has a total capacity of 5.8 mgd.[21] The project would utilize 15,087 gpd or 0.013 mgd. Therefore, the North Sycamore PS would have ample capacity to serve the project site and impacts associated with infrastructure would be less than significant.

[20] 2015 City of Pleasanton Urban Water Management Plan, 5.7 2015 Compliance Daily Per Capita Water Use, page 5–6, June 2016.
[21] CDM. 2004. City of Pleasanton Water Master Plan Update, page 3–7. November.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Wastewater Treatment Capacity

| | |
|---|---|
| **Impact USS-5:** | **The project would result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.** |

### *Impact Analysis*

This project would result in a significant impact if the wastewater treatment provider would not be able to serve the project with adequate capacity. This analysis will evaluate capacity at facilities and infrastructure separately.

*Capacity*

As described previously, wastewater generated in Pleasanton is treated at the DSRSD's Regional Wastewater Treatment Facility (RWTF). Owned and operated by the DSRSD, this plant has an average daily dry weather flow of 17 mgd the City of Pleasanton is entitled to half this treatment capacity, or 8.5 mgd. The City's average annual wastewater flow is approximately 6.0 mgd, which leaves 2.5 mgd of remaining capacity. This remaining capacity is sufficient to serve Pleasanton's planned buildout growth as anticipated in the General Plan. This project would generate an estimated 12,792 gpd of wastewater as calculated previously. As such, this project's wastewater generation represents less than 1 percent of the remaining 2.5 mgd capacity. Further, as described previously, the project is consistent with General Plan and HVSP buildout projections, and, therefore, the wastewater treatment needs of the project have been accounted for in long-range planning efforts and impacts to wastewater treatment facility would be less than significant.

*Infrastructure*

As mentioned in Section 3.14.2, RMC completed a Water and Sewer Study for the unincorporated portion of the HVSP Area. Effluent from the project is likely to discharge directly into PS S-14. The project site was assumed to be built with a maximum of 22 units, per the HVSP, however, there is adequate capacity in PS S-14 even under projected project buildout. In addition, the City of Pleasanton's Engineering Department determined that the force main that PS-14 pumps to is adequately sized to accommodate projected flows with the project.[22] Therefore, impacts would be less than significant.

[22] RMC Water and Environment. 2016. Technical Memorandum, Happy Valley Water & Sewer Study. November 21.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Solid Waste

**Impact USS-6: The project would be served with adequate landfill capacity.**

### *Impact Analysis*

Pleasanton Garbage Service serves the City of Pleasanton and offers services including solid waste collection from commercial, industrial, and residential customers within the City. Collected solid waste is sorted at the Pleasanton Transfer Station and Recycling Center, which is also operated by PGS. The Pleasanton Transfer Station and Recycling Center has a design capacity of 720 tons per day.

Non–recyclable materials are transported to Vasco Road Sanitary Landfill in Livermore. The Landfill covers 323 acres, of which 246 acres are permitted for disposal. The Landfill is permitted to receive up to 2,518 tons of waste daily. The Landfill has a total capacity of 32,970,000 cubic yards (cy) and a remaining capacity of 7,959,079 cy. According to the Solid Waste Facility Permit, the estimated closure date for this facility is 2022.

*Short-term Construction Impacts*

There are currently two structures on the project site; however, neither structure is proposed to be removed as part of the project. The EPA estimates a residential construction waste generation rate of 4.39 pounds per square foot. The proposed 39 residential units cover 24.53 acres or 1,068,526 square feet. Project construction is projected to generate over 4,690,832 pounds or 2,345 tons of waste. Spread over the 575-working-day demolition and construction schedule, this equates to approximately 4.08 tons per day. The Vasco Landfill is permitted to receive 2,518 tons of waste per day. As such, the 4.08 tons per day of construction/demolition debris generated by the project represents a nominal percent of the quantity of solid waste that the landfill currently accepts on a daily basis. Therefore, short-term construction impacts associated with permitted landfill capacity would be less than significant.

*Long-term Operational Impacts*

Based on solid waste residential generation rates of 12.23 pounds per single-family home per day published by CalRecycle, the project's estimated waste generation is approximately 477 pounds per day. As previously addressed, the Vasco Landfill is permitted to receive 2,518 tons of waste per day. As such, the 477 pounds of solid waste per day that the project would generate equates to less than 0.01 percent of what the landfill presently receives on a daily basis. Thus, the project's solid waste generation would represent only a nominal increase in the total daily amounts of solid waste

received at the landfill. Therefore, long-term operational impacts associated with permitted landfill capacity would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

## Solid Waste Regulations

| | |
|---|---|
| **Impact USS-7:** | **The project would comply with federal, state, and local statutes and regulations related to solid waste.** |

### *Impact Analysis*

A significant impact would occur if the project would conflict with federal, state, or local statutes and regulations related to solid waste. In order to comply with Policy 26 of the City's General Plan 2025 and Municipal Code (PMC) Section 9.21 construction and demolition debris diversion requirements, the project would be required to reduce the volume of solid waste through recycling and reuse of materials. Demolition and construction activities on the project site must adhere to the City's Construction and Demolition Debris Ordinance, which requires that a minimum of 50 percent of construction and demolition debris be diverted from landfills. Additionally, the City has adopted a Source Reduction and Recycling Element (Measure D) to establish higher waste diversion goals set by the State. The project would be required to comply with the provisions of these elements. Compliance with the above is required by the City of all new development projects.[23] Therefore, impacts associated with solid waste statutes and regulations would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

[23] City of Pleasanton 2005 General Plan 2025 Chapter 6 Public Facilities and Community Program Element, page 6–18, July 2009

## Energy

**Impact USS-8: The project would not result in the inefficient, unnecessary, or wasteful use of energy.**

### *Impact Analysis*

Pacific Gas and Electric Company (PG&E) provides electricity and natural gas service to the City of Pleasanton and the project site. All on-site energy connections would be located underground in public rights-of-way or public utility easements.

New residential developments are required to comply with the Pleasanton Climate Action Plan's applicable energy conservation and reduction measures as well as the applicable measures of the General Plan's Energy Element. In addition, the proposed project would be subject to the most recently adopted edition of the Title 24 energy efficiency standards at the time building permits are sought. Title 24 standards include a number of requirements associated with energy conservation, thereby ensuring that the project uses would not result in the inefficient, wasteful, or unnecessary use of energy. Impacts would be less than significant.

### *Level of Significance Before Mitigation*

Less than significant impact.

### *Mitigation Measures*

No mitigation is necessary.

### *Level of Significance After Mitigation*

Less than significant impact.

# SECTION 4: CUMULATIVE EFFECTS

## 4.1 - Introduction

CEQA Guidelines Section 15130 requires the consideration of cumulative impacts within an EIR when a project's incremental effects are cumulatively considerable. Cumulatively considerable means that ". . . the incremental effects of an individual 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." In identifying projects that may contribute to cumulative impacts, the CEQA Guidelines allow the use of a list of past, present, and reasonably anticipated future projects, producing related or cumulative impacts, including those which are outside of the control of the lead agency.

In accordance with CEQA Guidelines Section 15130(b), ". . . the discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, the discussion need not provide as great [a level of] detail as is provided for the effects attributable to the project alone." The discussion should be guided by standards of practicality and reasonableness, and it should focus on the cumulative impact to which the identified other projects contribute rather than on the attributes of other projects that do not contribute to the cumulative impact.

The proposed project's cumulative impacts were considered in conjunction with other proposed and approved projects in the City of Pleasanton. Table 4-1 provides a list of the other projects considered in the cumulative analysis. As indicated by Table 4-1, total development of the projects considered in the cumulative impact analysis includes 132 housing units and 960,000 square feet of scientific campus.

**Table 4-1: Cumulative Projects**

| Jurisdiction | Project | Characteristics | Location | Status |
|---|---|---|---|---|
| City of Pleasanton | Lund Ranch Development | 43 single-family homes | Sunset Creek and Lund Ranch Road | Approved (No units built) |
| | TTK Property | 12 single-family homes | 1073 Happy Valley Road | Approved (9 units built; 1 under construction; 2 unbuilt) |
| | Callippe Preserve and Municipal Golf Course | 34 single-family homes | Happy Valley Road | Approved (31 units built; 2 under construction; 1 unbuilt) |
| | ThermoFisher Scientific Campus | 960,000 square feet at full buildout | Sunol Boulevard at Sycamore Road and Arlington Drive | Approved (306,600 square feet built out; 653,400 square feet unbuilt) |

**Table 4-1 (cont.): Cumulative Projects**

| Jurisdiction | Project | Characteristics | Location | Status |
|---|---|---|---|---|
| | Wentworth | Three single-family homes | 1157 Sleepyhead Lane (formerly 1157 Happy Valley Road) | Approved (One unit unbuilt) |
| | Development potential | 40 single-family homes | Happy Valley area | Approved or entitled |

Notes:
[1] These 40 single-family homes are exclusive of the other projects listed in Table 4-1.
Source: City of Pleasanton Community Development Department, 2018; FCS, 2018.

## 4.2 - Cumulative Impact Analysis

The cumulative impact analysis below is guided by the requirements of CEQA Guidelines Section 15130. Key principles established by this section include:

- A cumulative impact only occurs from impacts caused by the proposed project and other projects. An EIR should not discuss impacts that do not result from the proposed project.
- When the combined cumulative impact from the increment associated with the proposed project and other projects is not significant, an EIR need only briefly explain why the impact is not significant; detailed explanation is not required.
- An EIR may determine that a project's contribution to a cumulative effect impact would be rendered less than cumulatively considerable if a project is required to implement or fund its fair share of mitigation intended to alleviate the cumulative impact.

The cumulative impact analysis that follows relies on these principles as the basis for determining the significance of the project's cumulative contribution to various impacts.

### 4.2.1 - Aesthetics, Light, and Glare

The geographic scope of the cumulative aesthetics, light, and glare analysis is the visible area surrounding the project site and the projects listed in Table 4-1. This encompasses the eastern valley of Alameda County within the Amador Valley. This valley is outlined by the Diablo Range of hills, Trampas Ridge, Black Hills, and Mount Diablo.

The affected area is a mix of residential, agricultural (pastures), and open space land uses. The project and the projects listed in Table 4-1 propose urban and rural development, which would reduce the amount of existing open space. Open space areas such as hillsides and riparian vegetation provide scenic value to the area, and a reduction of open space areas would be a cumulatively considerable impact.

However, the project proposes to leave 75 percent of the site in its existing open space condition. The project also must comply with the Happy Valley Specific Plan (HVSP) site development standards

and Design Guidelines, which emphasize the incorporation of existing natural features into site plans. In addition, the project would result in less light and glare than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. By complying with City codes and guidelines and implementing its proposed site design, the project would minimize its impact on visual resources such that no additional mitigation would be required.

Projects listed in Table 4-1 are not generally within view of the project, and, therefore, the project's impacts as these relate to aesthetic resources would not combine with other relevant cumulative projects. Other projects that are located in the City of Pleasanton would be subject to the same codes and guidelines to reduce aesthetic impacts and would be reviewed for potential aesthetic and visual resource impacts. As such, the project would not have a cumulatively considerable impact on aesthetics and visual resources.

### 4.2.2 - Air Quality

The geographic scope of the cumulative air quality and greenhouse gas emissions analysis is the San Francisco Bay Area Air Basin, which covers all or portions of the counties of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano. Air quality is impacted by topography, dominant air flows, atmospheric inversions, location, and season; therefore, using the Air Basin represents the area most likely to be impacted by air emissions. As discussed more fully in Section 3.2,Air Quality, air quality impacts are inherently cumulative in nature.

The project was assessed for consistency with the Bay Area Air Quality Management District's (BAAQMD's) Clean Air Plan. Other projects listed in Table 4-1 would be required to demonstrate consistency with the Clean Air Plan and provide mitigation, as necessary. Because the project is consistent with the Clean Air Plan, the project would not contribute to any cumulatively considerable impacts related to Clean Air Plan consistency.

The project would result in new air emissions related to construction fugitive dust that could contribute to the violation of BAAQMD air quality standards. Mitigation is proposed, requiring the implementation of fugitive dust reduction measures during construction. In addition, the project would result in fewer air emissions during construction and operation than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects listed in Table 4-1 would also have the potential to emit construction fugitive dust and would similarly be required to implement applicable mitigation. However, because the project would mitigate its fugitive dust emissions to less than a significant level, it would not make a cumulatively considerable contribution to any related cumulatively significant impact.

All of the projects listed in Table 4-1 would result in new air emissions, during construction or operations (or both). The project would emit construction criteria pollutant emissions at levels that would exceed the BAAQMD thresholds. Mitigation is proposed requiring off-road diesel-powered construction equipment with greater than 50 horsepower to meet EPA Tier 3 off-road emission standards, to the extent feasible. Implementation of this mitigation would reduce construction-

related criteria pollutant emissions to below BAAQMD thresholds. Other projects that exceed BAAQMD thresholds would also be required to mitigate their impacts. Because the project would mitigate its construction criteria pollutant emissions to a less than significant level, it would not contribute to related cumulatively significant impacts.

The project may have the potential to expose sensitive receptors to construction-generated diesel particulate matter. Mitigation is proposed requiring off-road diesel-powered construction equipment with greater than 50 horsepower to meet EPA Tier 3 off-road emission standards to the extent feasible, thereby reducing diesel generated particulate matter. Other projects listed on Table 4-1 would also have the potential to expose sensitive receptors to pollutants, and would similarly be required to implement applicable mitigation. Impacts to sensitive receptors tend to be localized, and would likely not combine with the emissions of projects listed in Table 4-1 to create cumulatively significant impacts to any sensitive receptor, due to their distance from the project site. Furthermore, because the project would mitigate its diesel particulate matter emissions to a less than significant level, it would not make a cumulatively considerable contribution to any related cumulatively significant impact.

### 4.2.3 - Biological Resources

The geographic scope of the cumulative biological resources analysis is the project vicinity. The project site is located in an area characterized by both urban development, agricultural/rangeland, and undeveloped/open space areas. Adjacent urban habitats tend to be characterized as highly disturbed, thereby localizing impacts. Adjacent undeveloped habitats are generally undisturbed, thus retaining the potential to provide habitat continuity.

As described in Section 3.3, Biological Resources, the project may have a substantial adverse impact on the following Congdon's tar plant, which is a special-status plant species. It also may have an adverse impact on the following special-status wildlife species: California tiger salamander, burrowing owl, American badger, golden eagle, grasshopper sparrow, loggerhead shrike, pallid bat, Townsend's big-eared bat, Callippe silverspot butterfly, white-tailed kite, and northern harrier. Mitigation Measures (MMs) BIO-1a through BIO-1d are proposed, requiring appropriate surveys and avoidance/minimization measures. The required mitigation would reduce the project's contribution to any significant cumulative impact on special-status wildlife species to less than cumulatively considerable. In addition, the project would result in fewer impacts to special-status wildlife species than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Some of the other projects listed in Table 4-1 are located on sites with similar biological attributes and likewise would be required to mitigate for impacts on special-status plant and wildlife species in a manner similar to the project.

The project site contains jurisdictional seasonal wetlands as designated by the RWQCB. The project would submit applications for Section 404 CWA Nationwide Permit and 401 Water Quality Certification permits if development results in impacts to the on-site wetland resources as required by MM BIO-2. The required mitigation would reduce the project's contribution to any significant cumulative impact on wetlands and jurisdictional features to less than cumulatively considerable. In addition, the project would result in fewer impacts to jurisdictional seasonal wetlands than originally

contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Some of the other projects listed in Table 4-1 are located on-sites with similar biological attributes and likewise would be required to mitigate for impacts on wetlands and jurisdictional features in a manner similar to the project.

All other project-related biological resource impacts were found to be less than significant and did not require mitigation (e.g., sensitive natural communities or riparian habitat, fish and wildlife corridors, and local policies or conservation plans). In addition, the project would result in fewer impacts to other project-related biological resources than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects that result in such impacts would be required to mitigate for their impacts. Because the project would not result in significant impacts to special-status plants, wetlands, wildlife corridors, nursery sites, or conservation plans, it would not have a related cumulatively significant impact.

Given the above information, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to biological resources.

### 4.2.4 - Cultural Resources

The geographic scope of the cumulative cultural resources analysis is the project vicinity. Cultural resource impacts tend to be localized because the integrity of any given resource depends on what occurs only in the immediate vicinity around that resource, such as disruption of soils; therefore, in addition to the project site itself, the area near the project site would be the area most affected by project activities (generally within a 500-foot radius).

Although there is the possibility that previously undiscovered resources could be encountered by earthwork activities on the project site, the implementation of standard construction mitigation measures would ensure that undiscovered cultural resources are not adversely affected by project-related construction activities, which would prevent the destruction or degradation of potentially significant cultural resources in the project vicinity. Standard construction monitoring and, if necessary, avoidance or recovery procedures would be required for any project with the potential to adversely affect cultural resources. In addition, the project would result in fewer impacts to cultural resources than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects would be required to implement similar construction mitigation.

Therefore, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to cultural resources.

### 4.2.5 - Geology

The geographic scope of the cumulative geology, soils, and seismicity analysis is the immediate project vicinity, including those projects listed in Table 4-1. Adverse effects associated with geologic, soil, and seismic hazards tend to be localized, and the area near the project site would be the area most affected by the project's activities (generally within a 0.25-mile radius).

The project site is located within a State of California Earthquake Fault Hazard Zone for the Verona Fault, which crosses the site adjacent to the 25-percent slope limit. Several other faults, including the Calaveras and Las Positas faults, are located approximately 2 miles southwest and 4 miles east of the project site, respectively; thus, the project may be susceptible to strong ground shaking during a seismic event. MM GEO-1a requires the project applicant to adhere to the recommendations set forth in the 2015 ENGEO Geotechnical Feasibility Report for building foundation design. In addition, the project is within an area susceptible to landslides. The project would implement MM GEO-1b, which incorporates the soil engineering and building designs set forth in the "Preliminary Site Recommendations" of the ENGEO Report. The project site is also within an area located on a geologic unit or soil that is unstable and would incorporate MM-GEO 3, which provides specific design recommendations related to grading and requires approval of extension of the keyway by a Geotechnical Engineer. Associated project-level impacts would be less than significant with mitigation incorporated.

Some or all of the other projects listed in Table 4-1 would be exposed to similar seismic hazards as the project and, therefore, would be expected to implement similar regulatory requirements and mitigation measures. Therefore, there is a less than significant potential cumulative impact for the project, in combination with other projects, to expose people or structures to substantial adverse effects, including the risk of loss, injury, or death in the event of a major earthquake; fault rupture; ground shaking; seismic-related ground failure; landslide; or liquefaction.

Furthermore, it is reasonable to assume that other cumulative development projects would be required to comply with all applicable laws and regulations for slope stability and erosion control that would reduce project-level impacts to a less than significant level. Therefore, the proposed project, in conjunction with other cumulative projects, would not have a cumulatively considerable contribution to cumulative impacts on geology and soils.

## 4.2.6 - Greenhouse Gas Emissions

As discussed more fully in Section 3.6, Greenhouse Gas (GHG) Emissions-related impacts are inherently cumulative in nature. The project would emit new GHG emissions. Other projects listed in Table 4-1 would also emit new GHG emissions. The project's construction and operational GHG emissions would not exceed the BAAQMD's annual $MTCO_2e$ threshold. The City adopted the City of Pleasanton Climate Action Plan (CAP), which is a qualified GHG Reduction Plan according to the BAAQMD's 2017 guidelines. This Climate Action Plan included a GHG inventory for current year and a forecast for 2020 for the City of Pleasanton, and identified GHG reduction measures that could be implemented in order to substantially reduce GHG emissions and meet the goal of 15 percent below its 2005 community-wide baseline. In addition, the project would result in fewer GHG emissions during construction and operation than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects would also be required to demonstrate whether they exceed GHG thresholds and, if need be, mitigate their impacts to the extent feasible in compliance with the CAP. The GHG emissions for the project, in conjunction with other existing, planned, and probable future projects, have been accounted for within the Climate Action Plan and would not have a cumulatively significant impact related to GHGs.

## 4.2.7 - Hazards and Hazardous Materials

The geographic scope of the cumulative hazards and hazardous materials analysis is the project vicinity. Adverse effects of hazards and hazardous materials tend to be localized; therefore, the area near the project site would be most affected by project activities. Hazards and hazardous materials are extensively regulated at the federal, state, and local levels. There are no land uses in the vicinity of the project site that are known to utilize large quantities of hazardous materials or involve hazardous activities, thus there is no existing, related cumulatively significant impact.

All project-related hazards and hazardous material impacts (routine transport, use or disposal, accidental release, risk of upset, hazards in proximity to schools, hazardous materials site listing, airport and airstrip operations, emergency response and evacuation routes, and wildland fires) were found to be less than significant and did not require mitigation. In addition, the project would result in the use and transportation of less hazardous materials during construction and operation than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects that result in such impacts would be required to mitigate for their impacts. Because the project would not result in significant impacts related to the aforementioned potential hazards, it would not have a related cumulatively significant impact.

Given the above information, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to hazards and hazardous materials.

## 4.2.8 - Hydrology and Water Quality

Impacts on hydrology and water quality typically occur within a defined watershed. As described in Section 3.8, Hydrology and Water Quality, the project site lies within the Alameda Creek watershed, a drainage basin encompassing about 675 square miles between Mount Hamilton and Mount Diablo. Each stream, tributary, and reservoir within this area has its own smaller watershed that feeds into Alameda Creek and ultimately San Francisco Bay. The San Francisco Bay Regional Water Quality Control Board has characterized the Alameda Creek as impaired by diazinon. In addition, the Lower San Francisco Bay is listed as impaired by chlordane, DDT, dieldrin, and mercury from nonpoint sources; by dioxin compounds, furan compounds, and mercury from atmospheric deposition; by exotic species from ballast water; and by PCBs and dioxin-like PCBs from unknown nonpoint sources. Therefore, there is an existing cumulatively significant impact with respect to pollutants in these water bodies.

The project would involve short-term construction and long-term operational activities that would have the potential to degrade water quality in downstream water bodies. The project would be required to obtain a Construction General Permit from the State Water Resources Control Board, which would require preparation of a SWPPP that would control potential discharges of contaminants. The project would be required to comply with Chapter 9.14 Stormwater Management and Discharge Control of the City of Pleasanton Municipal Code. Design features would comply with the County's current NPDES permit and Clean Water Program Stormwater C.3 Guidebook. In addition, the project would result in fewer impacts to hydrology and water quality resulting from short-term construction and long-term operational activities than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other

projects that propose new development within the City would be required to implement these policies in accordance with adopted regulations, while County projects would be subject to the Construction General Permit if applicable. The combined implementation of construction and operational water quality measures among the various development projects listed in Table 4-1 would be expected to reduce any related cumulative impacts, and the project itself would not be expected to make a cumulatively considerable contribution to any existing surface water quality impacts.

All project-related hydrology impacts were found to be less than significant and did not require mitigation. Other projects that result in related impacts would be required to mitigate for their impacts. Because all other project-related hydrology impacts are less than significant, the project would not have a cumulatively considerable contribution to any significant cumulative hydrology or water quality impact.

Given the above information, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to hydrology and water quality.

### 4.2.9 - Land Use and Planning

The geographic scope of the cumulative land use analysis is the project vicinity within the City of Pleasanton and its Sphere of Influence. Land use decisions for both the project and for some of the projects listed in Table 4-1 are made at the City level, while land use decisions for projects in Alameda County are made by the County. Development within Pleasanton is governed by Pleasanton General Plan 2005–2025 and the Pleasanton City Code, which ensure logical and orderly development and require discretionary review to ensure that projects do not result in land use impacts due to inconsistency with the General Plan and other regulations.

This project would be inconsistent with the existing General Plan and HVSP and would require the General Plan and HVSP amendments as described throughout this SEIR. The General Plan and HVSP Amendments would be consistent with widely accepted planning principles of facilitating logical and orderly growth, ensuring compatibility with surrounding uses, and ensuring consistency with the goals and policies of the General Plan and HVSP. Since the project entails amendments to the General Plan and the HVSP, inconsistency with the existing designation is an element of the project itself, which would necessitate a legislative policy decision by the agency and would not signify a potential environmental effect. As such, if approved, the proposed General Plan and HVSP Amendments would serve as a self-mitigating aspect of the project that would serve to correct any conflict that would otherwise exist. Since the project would require amendments to both the General Plan and the HVSP, the project would have less than significant impacts to land use and planning.

Development projects in the City of Pleasanton would be required to demonstrate consistency with the City's General Plan and applicable codes and ordinances. Development projects in Alameda County would be required to demonstrate consistency with the County General Plan and applicable codes and ordinances. This would ensure that these projects comply with applicable planning regulations.

It has been determined that the project would not divide an established community, nor would it conflict with any habitat conservation plans. Because all other project-related land use and planning

impacts are less than significant, the project would not have a cumulatively considerable contribution to any significant cumulative land use and planning impact.

Given the above information, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to land use and planning.

### 4.2.10 - Noise

The geographic scope of the cumulative noise analysis is the project vicinity, including surrounding sensitive receptors. Noise impacts tend to be localized; therefore, the area near the project site (approximately 0.25 mile) would be the area most affected by project activities.

The project's construction noise levels may cause a temporary substantial increase in noise levels at nearby receptors. Proposed MM NOI-1 would require implementation of construction noise attenuation measures to reduce noise levels. In addition, the project would result in less construction noise than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Other projects listed in Table 4-1 that would expose nearby sensitive receptors to excessive construction noise would be required to implement similar mitigation. Construction noise is a localized phenomenon, however, and the properties of noise are not additive. Furthermore, noise from construction activities on multiple projects may not overlap temporally due to distance, and therefore, the project would not contribute to a cumulatively significant construction noise impacts.

The project's construction and operational vibration levels would not exceed annoyance thresholds and would be lower than originally contemplated in the HVSP FEIR because the project would result in a net reduction of units and would include construction of the Bypass Road. Vibration is a highly localized phenomenon. Because of distance, there would be no possibility for vibration associated with the project to combine with vibration from other projects. Therefore, the project would not contribute to a cumulatively significant vibration impact.

The project's vehicular trips would not make a substantial incremental contribution to ambient noise levels under Existing with Project and Cumulative with Project conditions. These noise levels account for existing vehicle trips as well as vehicle trips from future projects. In addition, the project would result in less ambient noise than originally contemplated in the HVSP FEIR because it would result in a net reduction of units and would not include construction of the Bypass Road. Moreover, other projects would be required to evaluate off-site roadway noise and, if necessary, mitigate for such impacts pursuant to local regulations. Finally, because most of the other projects listed in Table 4-1 are more than 1 mile from the project site, vehicular trips would be unlikely to add to roadway noise levels in the project vicinity. Thus, the project would not combine with other projects to cause a cumulatively considerable increase in ambient roadway noise.

Therefore, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to noise.

## 4.2.11 - Public Services

The geographic scope of the cumulative public services analysis is the service area of the providers that serve the proposed project. Because of differences in the nature of the public service topical areas, they are discussed separately. Section 3.11, Public Services discusses impact areas related to fire and police protection, schools, parks, and other public facilities. Overall, no existing cumulative significant impacts have been identified for any of these areas, as all service providers are able to achieve the requisite level of service, capacity, or response times.

### Fire Protection and Emergency Medical Services

The geographic scope of the cumulative fire protection and emergency medical services analysis is the Livermore-Pleasanton Fire Department service area. The service area consists of the 55-square-mile area encompassing the City of Livermore and the City of Pleasanton, Pleasanton Ridge, Lawrence Livermore National Laboratory, and unincorporated areas of Alameda County, which includes Castlewood and Happy Valley.

The proposed project would result in 39 single-family detached homes and related on- and off-site improvements. The project proposes to develop and improve approximately 31 acres of the approximately 154-acre project site. The undeveloped acreage would remain agricultural open space, and approximately 80 acres would be dedicated as permanent agricultural open space. The project site is located within five miles of three fire stations within the City of Pleasanton. As such, the project would not create a need for new or expanded fire protection facilities and would not result in a physical impact on the environment. Additionally, the project would comply with all applicable requirements of the California Fire Code, including provisions that require adequate emergency access points, and ensure the project provides adequate access for fire apparatus. Furthermore, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR and would require less fire protection and emergency medical services. Other development projects in the Fire Department service area would be reviewed for impacts on fire protection and emergency medical services and would be required to address any potential impacts with mitigation. Therefore, the project, in conjunction with other future projects, would not have a cumulatively significant impact related to fire and emergency medical services.

### Police Protection

The geographic scope of the cumulative police protection analysis is the local service area for the Alameda County Sheriff's Office, which consists of the Pleasanton city limits and adjoining unincorporated areas.

The proposed project would result in 39 single-family detached homes and related on- and off-site improvements. The project proposes to develop and improve approximately 31 acres of the approximately 154-acre project site. The undeveloped acreage would remain agricultural open space and approximately 80 acres would be dedicated as permanent agricultural open space. While the project would increase the need for police services, any potential calls for service would be nominal in light of the small population increase attributed to the project. As such, the project

would not create a need for new or expanded law enforcement facilities and would not result in a physical impact on the environment. Furthermore, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR and would require less police protection. Other development projects in the Sheriff's Office service area would be reviewed for impacts on police protection services and would be required to address any potential impacts with mitigation. Because demand for law enforcement services is highly dependent on numerous factors (clientele, hours of operation, crime prevention measure, etc.), it is unlikely that there would be substantial overlap in demand. Therefore, the project, in conjunction with other future projects, would not have a cumulatively significant impact related to law enforcement services.

### Schools

The geographic scope of the cumulative schools analysis is the local service area for the Pleasanton Unified School District (PUSD) boundaries, which includes the Pleasanton city limits.

The project's 39 new single-family homes are expected to generate approximately 18 total new students. Because of the reduction in units, the project would result in fewer students than originally contemplated in the HVSP FEIR, which would lessen the project's impacts on schools. However, while the project alone is unlikely to result in a need for new or expanded district facilities, the project proponent would be required to pay development fees to PUSD to fund capital improvements to school facilities. Pursuant to Government Code Section 65995, payment of development fees is "full and complete mitigation" for impacts on schools. Therefore, the project, in conjunction with other future projects, would not have a cumulatively significant impact related to schools.

### Parks

The geographic scope of the cumulative parks analysis consists of the local and regional parks in the project vicinity.

The 39 single-family residential units would be expected to result in a population increase of approximately 117 people (at 3 persons per household). The project would develop approximately 31 acres (20 percent of the entire site), while 80 approximately acres (65 percent of the site) would be dedicated for the preservation of agricultural open space. As a result, the project would not result in the need for construction of new or expanded existing park facilities. In addition, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in fewer impacts to parks. Moreover, the project would make a substantial contribution to the preservation of agricultural open space by including the permanent dedication of approximately 80 acres of agricultural open space, which would be designated/zoned A/OS and accessible to the public via trails. As such, the project would not result in the off-site construction of new or expanded existing park facilities and would not result in a physical environmental impact. Other projects would similarly be required to provide parking or pay in-lieu fees to assist in achieve the City's parkland goal. Therefore, the project, in conjunction with other future projects, would not have a cumulative significant impact related to park facilities.

### Other Public Facilities (Libraries)

The geographic scope of the cumulative other public facilities analysis consists of the Pleasanton city limits.

The project's potential increase of 117 residents would not be expected to require new or substantially altered library facilities. As such, the project would not create a need for new or expanded library facilities and would not result in a physical impact on the environment. In addition, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in fewer impacts to other public facilities. Other projects may result in the increase of library use, but would similarly be required to pay development fees. Therefore, the project, in conjunction with other future projects, would not have a cumulative significant impact related to other library facilities.

## 4.2.12 - Transportation and Traffic

The geographic scope of the cumulative transportation analysis is the project vicinity and selected transportation facilities listed in Section 3.12, Transportation and Traffic. The cumulative analysis accounts for ambient growth and forecasted traffic generated by other development projects in combination with traffic generated by the project. The increase in traffic volumes on a roadway segment that does not meet current design standards could increase traffic hazards. Results of the level service analysis also show that the project would contribute to a slight worsening of already deficient operations for side-street movements at both the Sunol Boulevard northbound and southbound ramp intersection. As discussed in Section 3.12, project traffic impacts on intersection operations and roadway segments under a cumulative scenario are less than significant with mitigation.

The project would result in a net increase of 370 (weekday) daily trips, including 30-weekend-morning peak hour and 40-weekday-evening peak hour trips. Without the bypass road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way).

In the cumulative condition, the project would add traffic to Alisal Street and create roadway compatibility issues. Given the existing sharp curves and related traffic from the Callippe Preserve Golf Course, the project could result in a significant roadway hazard. To reduce impacts, the project would ensure that Alisal Street at Sycamore Road and Alisal Court would accommodate two-way travel. When implemented, mitigation measures would reduce impacts to a less than significant level.

The traffic assessment considered operations at the Sunol Boulevard at Interstate 680 northbound and southbound ramps. The ramps are projected to operate at an overall acceptable service level in the morning and evening peak hours. While the project would contribute trips to the Interstate 680 freeway interchange, the trips not result in substantial delay. In addition, the City plans to improve the interchange at Sunol Boulevard, with full funding through the Capital Improvement Program, which would improve circulation. All other study intersections would continue to operate at an acceptable service level without or with the bypass road.

Projects listed in Table 4-1 would also generate new vehicle trips that may trigger or contribute to unacceptable intersection, roadway, and freeway operations. All projects would be required, however, to mitigate for their fair share of impacts. As a condition of approval, the City of Pleasanton will collect applicable local and regional traffic impact fees in addition to fair share contributions for other improvements needed to mitigate significant impacts. Therefore, the project, in conjunction with other projects, would not result in a cumulatively significant impact.

For other transportation-related areas (air traffic patterns; emergency access; and public transit, bicycles, and pedestrians), the project would have a potential impact on roadway safety, but after the implementation of mitigation, impacts would be reduced to less than significant. Other projects that result in similar effects would be similarly required to mitigate impacts. Because the project can mitigate all other transportation impacts to a level of less than significant, it would not have a related significant impact with respect to these other topics.

## 4.2.13 - Utilities and Service Systems

The geographic scope of the cumulative utilities analysis is the service area of each of the providers serving the project. Because of differences in the nature of the utility service areas, they are discussed separately. No existing cumulatively significant impacts have been identified for any of these areas, as all service providers are able to achieve the requisite level of service and capacity.

### Water

The geographic scope of the cumulative potable water analysis is the service area of the City of Pleasanton Utilities Division, which provides potable water to residents and businesses within the city limits. Water in unincorporated areas generally is provided by private wells.

The project would require the connection of 39 residential units to the City's water system. Demand also would be generated by the project's landscaping. It is estimated that the project would use approximately 16.6 acre-feet of water annually. As indicated in Section 3.14, Utilities, the City would have adequate water supplies and the necessary infrastructure to serve the project during normal and dry years. The project is consistent with the land use and population assumptions in the Happy Valley Specific Plan and City General Plan, which provides the basis for City water demand estimates. Furthermore, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in less potable demand. The project, along with other projects listed in Table 4-1, would be required to comply with provisions of the City Code related to water conservation. As such, the project, in conjunction with other projects in Pleasanton, would not have a cumulative significant impact related to water supply. Therefore, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to potable water supply.

### Wastewater

The geographic scope of the cumulative wastewater analysis is the service area of the City of Pleasanton, the Dublin-San Ramon Services District (DSRSD), and Livermore-Amador Valley Wastewater Management Agency (LAVWMA), which provides wastewater collection and treatment

services for City residents and businesses. In unincorporated areas, individual or group septic systems generally are used.

The project is estimated to generate approximately 12,792 gallons per day of wastewater or 0.013 million gallons per day (mgd). The Regional Water Treatment Facility (RWTF), which would accommodate the project's wastewater, currently has approximately 2.5 mgd of treatment capacity available for the City of Pleasanton. The project's wastewater generation would represent approximately less than one percent of available treatment capacity. Furthermore, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in less generation of wastewater. It is anticipated that the projects listed in Table 4-1 that are located in the City's service area would each generate similar volumes of wastewater. Therefore, the project, in conjunction with other existing, planned, and probable future projects in the City, would not have a cumulatively significant impact related to wastewater. Projects in the County would be required to arrange for their own wastewater disposal in accordance with applicable state and county regulations.

### Storm Drainage

The geographic scope of the cumulative storm drainage analysis is the project vicinity, consisting of areas that drain to the City's storm drainage system. County development generally relies on percolation into the ground or on a system of collection ditches and stream channels.

The majority of projects in Table 4-1 are located in more urban areas and would be served by municipal storm drainage systems. Consistent with measures in the LID Manual, the project would incorporate stormwater retention basin and bio-retention areas into the development, which would reduce the volume and velocity of runoff the project would generate. Moreover, 75 percent of the site will remain undisturbed, providing permeable surfaces that allow groundwater recharge. This would reduce the amount of storm drainage that leaves the project site. Therefore, the project, in conjunction with other existing, planned, and probable future projects, would not have a cumulatively significant impact related to storm drainage.

### Solid Waste

While solid waste and recycling collection services for the project site would be provided by Pleasanton Garbage Service (PGS), the geographic scope of the cumulative solid waste analysis is Alameda County, which operates solid waste landfills and oversees regional waste diversion programs.

The project is anticipated to generate approximately 477 pounds of solid waste per day once complete. PGS transports solid waste to Vasco Road Sanitary Landfill in Livermore, which has a permitted daily capacity of 2,518 tons/day (CalRecycle 2016) and a total remaining total permitted capacity of 7.9 million tons through 2022. The anticipated waste volume of the project represents approximately less than one percent of the landfill's permitted daily capacity. As such, sufficient capacity is available to serve the project as well as existing, planned, and probable future land uses in the County for the near future. Furthermore, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in less generation of waste. The other projects listed in Table 4-1, particularly the residential projects, are

expected to generate less solid waste than the project because of the smaller number of residential units. Additionally, state and county regulations encourage waste diversion through recycling and composting, among other activities. These activities are encouraged in both the County and the cities. Given the above information, the project, in conjunction with other future projects, would not have a cumulatively significant impact related to solid waste.

## Energy

The geographic scope of the cumulative energy analysis is the Pacific Gas & Electric Company (PG&E) service area. PG&E's electrical service area consists of the City of Pleasanton and all of Alameda County.

The project's structures would be designed in accordance with Title 24, California's Energy Efficiency Standards for Residential and Nonresidential Buildings as applicable. These standards include minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., HVAC and water heating systems), and indoor and outdoor lighting. The incorporation of the Title 24 standards into the project would ensure that the project would not result in the inefficient, unnecessary, or wasteful consumption of energy. In addition, because of the reduction in units, the project would result in fewer residents than originally contemplated in the HVSP FEIR, which would result in less energy usage. Future development projects in the PG&E service area also would be required to comply with Title 24 energy efficiency standards. Therefore, the project, in conjunction with other future projects, would not have a cumulatively significant impact related to energy consumption.

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# SECTION 5: ALTERNATIVES TO THE PROPOSED PROJECT

## 5.1 - Introduction

In accordance with CEQA Guidelines Section 15126.6, this Subsequent Environmental Impact Report (SEIR) contains a comparative impact assessment of alternatives to the proposed project. The primary purpose of this section is to provide decision-makers and the general public with a reasonable number of potentially feasible project alternatives that could attain most of the basic project objectives, while avoiding or reducing any of the project's significant adverse environmental effects. However, all project impacts can be mitigated to below a level of significant; therefore, the project does not have any significant unavoidable impacts. As a result, an analysis of alternatives to the project is not technically required under CEQA.

CEQA Guidelines Section 15126.6 states:

> Because an EIR must identify ways to mitigate or avoid the significant effects that a project may have on the environment, the discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project . . .

Although the project would not result in any significant environmental effects with mitigation, analysis of three alternatives to the project is provided for informational purposes and to allow decision-makers the opportunity to consider the project in light of hypothetical alternative development scenarios, thereby promoting CEQA's purpose as an information disclosure statute. This analysis is guided by the following considerations set forth under CEQA Guidelines Section 15126.6:

- An EIR need not consider every conceivable alternative to a project;
- An EIR should identify alternatives that were considered by the lead agency, but rejected as infeasible during the scoping process;
- Reasons for rejecting an alternative include:
  - Failure to meet most of the basic project objectives;
  - Infeasibility; or
  - Inability to avoid significant environmental effects.

### 5.1.1 - Significant Unavoidable Impacts

With the implementation of mitigation, the proposed project would not result in any significant unavoidable impacts.

### 5.1.2 - Alternatives to the Proposed Project

The three alternatives to the proposed project analyzed in this section are as follows:

- **No Project/No Build Alternative:** Under the No Project/No Build Alternative the proposed project would not be constructed and the project site would remain vacant. No new housing, roads, or trails would be developed on the 154-acre site.
- **22 Lot Development on Spotorno Flat Area:** Under this alternative, the project would develop 22 residential units, instead of 39, on the Spotorno Flat Area portion of the project site. All other aspects of the project would remain the same as the proposed project, including trails. This alternative would also not include construction of the Bypass Road.
- **39 Units With Construction of the Bypass Road:** Under this alternative, the project would be developed with 39 residential units on the Spotorno Flat Area portion of the site and construct a Bypass Road as proposed in the Happy Valley Specific Plan. The Bypass Road would be constructed to link Westbridge Lane and Sycamore Creek Way.

The three alternatives to the proposed project are analyzed below. These analyses compare the proposed project and each individual project alternative. In several cases, the description of the impact may be the same under each alternative when compared with the CEQA Thresholds of Significance (i.e., both the project and the alternative would result in a less than significant impact). The actual degree of impact may be slightly different between the proposed project and each alternative, and this relative difference is the basis for a conclusion of greater or lesser impacts.

## 5.2 - Project Objectives

As stated in Section 2, Project Description, the objectives of the proposed project are to:

- Create a high-quality, single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped, publicly-accessible open space with adequate connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent measures PP and QQ.

## 5.3 - Alternative 1—No Project/No Build Alternative

CEQA Guidelines Section 15126.6(e) requires EIRs to evaluate a "No Project Alternative," which is defined as the "circumstance under which the project does not proceed." Under the No Project/No Build Alternative, the project would not be developed and this alternative would not include the refinement of the Urban Growth Boundary (UGB) line. The project site currently has a land use

designation of Low Density Residential—Happy Valley Specific Plan Overlay, Medium Density Residential, and Open Space-Public Health and Safety under the General Plan (Exhibit 2-13 in Section 2, Project Description) and is undeveloped. The site is currently designated in the HVSP as PUD—Medium Density Residential (PUD-MDR); PUD—Semi-Rural Density Residential (PUD-SRDR); and PUD—Agriculture/Open Space (PUD-AG/OS) as seen in Exhibit 2-14 in Section 2, Project Description. The No Project/No Build Alternative consists of the project site remaining in its current state for the foreseeable future.

### 5.3.1 - Impact Analysis

The No Project/No Build Alternative would not advance any of the project objectives. The project site would remain vacant and undeveloped for the foreseeable future. In addition, since this alternative would not include the UGB refinement, the location of the UGB line as plotted on the existing General Plan Land Use Map would continue to be potentially inconsistent with the text in Measure FF. No disturbance or new development would occur on the project site, thereby eliminating the potential for impacts associated with aesthetics, light and glare; air quality and greenhouse gas (GHG) emissions; biological resources; cultural resources; geology and soils; hazards and hazardous materials; hydrology and water quality; land use; noise; public services; transportation; and utilities and service systems.

Because there are no significant and unavoidable impacts caused by the project, this alternative would not avoid any significant and unavoidable impacts. The alternative would avoid the need to implement any of the mitigation measures required for the proposed project.

### 5.3.2 - Conclusion

The No Project/No Build Alternative would have less impact on all environmental topical areas than the proposed project. This alternative would not result in any significant, unavoidable impacts; however, this alternative would not advance any of the project objectives, including:

- Create a high quality single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent measures PP and QQ.

## 5.4 - Alternative 2—22 Lot Development On “Spotorno Flat Area”

### 5.4.1 - Impact Analysis

Under the 22 Lot Development Alternative, residential development would be reduced from 39 single-family residential units to 22 units, and would be limited to the same approximately 31-acre Spotorno Flat Area portion of the project site but with the existing Semi-Rural Density Residential (PUD-SRDR) HVSP designation. This alternative would reduce the number of units by 17 and would

conform to the density of one home per 1.4 acres. However, the development would still occur in the Spotorno Flat Area portion of the project site and wetlands and agricultural open space would still be retained in the same locations as provided in the proposed project.

This alternative would include the following General Plan Amendments:

1. Modify the General Plan land use diagram for an approximately 11-acre area in the east portion of Spotorno Flat Area from Open Space—Public Health and Safety to Low Density Residential with a density of 1.25 units/acre (Exhibit 2-13 in Section 2, Project Description). This modification is needed to align the boundaries of the land use district with the refined UGB line;
2. Modify the General Plan land use diagram for an approximately 15 acre area in the northeast portion of the Spotorno Upper Valley Area from Medium Density Residential to Open Space—Agriculture and Grazing (Exhibit 2-13 in Section 2, Project Description);
3. Refine the location of the Urban Growth Boundary (UGB) based on the 1996 voter-approved Measure FF to align with the base of Spotorno Hill consistent with the text of Measure FF. This change would also be formalized through a minor UGB refinement as shown in Exhibit 2-2 in Section 2, Project Description; and
4. Eliminate the Bypass Road from the General Plan Circulation Element.

This alternative would also include the following HVSP Amendments:

1. Change the Planned Unit Development—Medium Density Residential (PUD-MDR) land use/zoning designation in the Spotorno Upper Valley Area (Lot 97 and a small portion of Lot 98) to Planned Unit Development—Ag Open Space (PUD-A/OS) (Exhibits 2-14 and 2-15 in Section 2, Project Description); and
2. Eliminate the Bypass Road and modify associated trail alignments.

Access to the site would be the same as under the proposed project, with access points from Alisal Street and Westbridge Lane. This alternative would construct the trails as proposed in the April 2018 Working Draft of the Pleasanton Trails Master Plan including a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect the Spotorno Flat Area to the Foley property to the east, and Lund Ranch. Infrastructure services would remain the same as under the proposed project, but with a reduced amount of installation and fewer connections because of the reduced number of single-family homes. The common landscaped area would be developed to be appropriate for 22 single-family homes with a rural character to meet the SRDR site development standards.

## Aesthetics, Light, and Glare

With fewer residential units built, impacts on the landscape under this alternative would be less than under the proposed project. The residential structures would employ similar architecture and design elements, thereby resulting in a similar, albeit reduced, change in existing visual character compared to the proposed project. A reduced amount of exterior lighting and glare would occur because of the reduced amount of single-family homes developed. In addition, development would still need to comply with Part B of the HVSP, Section 18.20.030 of the Pleasanton Municipal Code, and California Energy Code (Title 24, Part 6 CCR). Therefore, the 22 Lot Development Alterative would have a less than significant impact on aesthetics, light, and glare, similar to the proposed project.

## Air Quality and Greenhouse Gas Emissions

This alternative would result in 17 fewer single-family homes and therefore fewer impacts to air quality and GHG emissions. Fugitive dust emissions from construction still could contribute to the violation of BAAQMD air quality standard violations, but mitigation would reduce such impacts, if any, to a level that is less than significant. This alternative also would lessen the amount of diesel particulate matter emissions generated by construction, but this project impact would still need to be reduced to less than significant with mitigation. Diesel particulate matter still may exceed BAAQMD thresholds, but mitigation would reduce such impacts to a level that is less than significant, similar to the proposed project.

The 22 Lot Development Alternative would generate fewer daily vehicle trips (AM peak, PM peak, and weekend) than the proposed project and therefore would reduce the operational emissions of criteria pollutants, toxic air contaminants, and GHG emissions compared with the proposed project. The decrease in daily trip generation would reduce the severity of the operational air quality and GHG emissions impacts. Since the proposed project's operational emissions were found to be below BAAQMD significance thresholds, this alternative would also likely have operational emissions below these thresholds. Therefore, the 22 Lot Development Alternative would have a similar impact on air quality/GHG emissions than the proposed project.

## Biological Resources

This alternative would result in similar impacts to biological resources, because the development of project would be located on the same footprint on the Spotorno Flat Area as the proposed project. Since this alternative has not been designed, it is assumed that encroachment on wetlands at the north end of the flat development area would not be avoided. As a result, mitigation measures would still be necessary. Therefore, the 22 Lot Development Alternative would have similar impacts on biological resources compared to the proposed project.

## Cultural Resources

This alternative would result in similar amounts of ground-disturbing activities compared to the proposed project because the same amount of acreage would be disturbed to construct the 22-unit alternative. Mitigation for potentially undiscovered historic resources, archaeological resources, paleontological resources, and burial sites would still be necessary. Therefore, the 22 Lot

Development Alternative would have less than significant impacts on cultural resources, similar to the proposed project.

### Geology, Soils, and Seismicity

This alternative would result in similar impacts to geology and soils, because the development of the project would be located on the same footprint on the Spotorno Flat Area as the proposed project. Similar development activities would occur, and, therefore, mitigation measures similar to those proposed for the proposed project would still be necessary. Therefore, the 22 Lot Development Alternative would have similar impacts on geology and soils compared to the proposed project.

### Hazards and Hazardous Material

As with the proposed project, this alternative would not create a significant hazard to the public or environment related to the transport, use, or storage of hazardous materials, nor would it emit hazardous emissions. Similar to the proposed project, this alternative would not require the implementation of mitigation associated with the demolition and removal of existing structures from the site because there are no existing structures. The 22 Lot Development Alternative would have hazards and hazardous materials impacts similar to the project, which were determined to be less than significant.

### Hydrology and Water Quality

Construction activities would require mitigation similar to the project for water quality impacts, as well as compliance with the SWRCB General Permit. The reduction of 17 homes compared to the proposed project would not result in a significant impact to water quality, groundwater, drainage, flood zones, dam failure, or inundation. This alternative would develop the same amount of acres as the proposed project and would be required to comply with the Alameda County Clean Water Program, City of Pleasanton Municipal Code, and State Water Board General Permit. Compliance with these agencies and policies would reduce impacts to less than significant. Therefore, the 22 Lot Development Alternative would have similar impacts on Hydrology compared to the proposed project.

### Land Use and Planning

The development of 22 lots would be consistent with the existing PUD-SRDR land use/zoning designation and, in that regard, would not require a HVSP amendment. However, to conform to Measure PP/QQ, this alternative would still require a change from the PUD-MDR to PUD-A/OS and the elimination of the Bypass Road and associated trail alignment modifications. Similar to the proposed project, the proposed General Plan and HVSP Amendments would be consistent with widely accepted planning principles of facilitating logical and orderly growth, ensuring compatibility with surrounding uses, and ensuring consistency with the goals and policies of the General Plan and HVSP. Since the alternative entails amendments to the General Plan and the HVSP, inconsistency with the existing designation is an element of the alternative itself, which would necessitate a legislative policy decision by the agency and would not signify a potential environmental effect. As such, the proposed General Plan and HVSP Amendments would serve as self-mitigating aspects of the alternative that would serve to correct any conflict that would otherwise exist. Since the project

would require amendments to both the General Plan and the HVSP, this alternative would have land use impacts similar to the proposed project.

### Noise

Construction noise impacts would be similar to those under the project, and mitigation would still be required to ensure that construction noise impacts are less than significant. This alternative would generate fewer daily vehicle trips than the project (see Transportation and Traffic, below), which would result in reduced traffic noise. However, based on information in Section 3.10, Noise, this alternative would have noise impacts similar to the project; impacts would be less than significant with the incorporation of mitigation under both scenarios.

### Public Services

Under this alternative, fewer people would be living or visiting the site on a daily basis and there would be a decreased demand for fire and police protection. In addition, this alternative would result in approximately 15 new students which would not create a significant impact to public school services. Furthermore, the reduced population would result in a decrease in local park use. Therefore, the 22 Lot Development Alternative would have an incrementally reduced impact on public services compared to the proposed project.

### Transportation and Traffic

Under this alternative, 17 fewer single-family homes would constructed resulting in fewer trips generated. The decrease in peak-hour trips would decrease the amount of cars at several intersections and roadway segments, but would not substantively change the impact conclusions presented in Section 3.12, Transportation and Traffic. In addition, this alternative would include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect the Spotorno Flat Area to the Foley property to the east, and Lund Ranch, which would be consistent with the April 2018 Working Draft of the Pleasanton Trails Master Plan. Therefore, this alternative would decrease the severity of impacts to transportation and traffic compared to the proposed project.

### Utilities and Service Systems

This alternative would result in 17 fewer single-family homes and as a result, there would less of a demand for water and energy and less generation of wastewater and solid waste. Utilities and service systems would still be able to meet the demands of residents under this alternative. Therefore, the 22 Lot Development Alternative would have less impact on utilities and service systems compared to the proposed project.

## 5.4.2 - Conclusion

The 22 Lot Development Alternative would result in reduced impacts to public services, transportation and traffic, and utilities. In addition, the 22 Lot Development Alternative would have

similar impacts with mitigation as the proposed project to all other resource areas (e.g., air quality, biological resources, and cultural resources).

The 22 Lot Development Alternative would advance the following objectives to a degree equivalent to the proposed project:

- Create a high quality single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped, publicly-accessible open space with adequate connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent measures PP and QQ.

## 5.5 - Alternative 3—39 Units with Construction of the Bypass Road

Under the 39 Unit with Construction of the Bypass Road Alternative, the project would develop 39 residential units on the Spotorno Flat Area portion of the site and would also construct a Bypass Road as proposed in the Happy Valley Specific Plan. The Bypass Road would be constructed to link Westbridge Lane and Sycamore Creek Way as can be seen in Figure 4 of the HVSP. In addition, the Bypass Road's alignment would be the revised alignment that was approved by the City Council and Blue Ribbon Committee in 2007. The bypass trail would be constructed in conjunction with the Bypass Road. This alternative was analyzed for potential traffic impacts by Fehr & Peers in the Traffic Analysis (Appendix I). All other development would be the same as that of the proposed project. The Bypass Road and trail would be constructed along the open ridgeline of the larger project site and would be visible from various points in Happy Valley.

### 5.5.1 - Impact Analysis

#### Aesthetics, Light, and Glare

With the same number of residential units built, impacts on the landscape under this alternative would be similar to the proposed project. The residential structures would employ the same architecture and design elements, thereby resulting in a similar change in existing visual character from the project.

The Bypass Road would remove agricultural open space from the hills and would introduce a new, man-made element into the existing scenic views of the hillside. An increased amount of exterior lighting and glare would occur because of the construction of the Bypass Road. Construction of the Bypass Road would create more lighting from street lights and reflective surfaces from cars and the road. In addition, car headlights from cars traveling on the Bypass Road would be visible from viewpoints around Happy Valley at night. Development would still comply with Part B of the HVSP, Section 18.20.030 of the Pleasanton Municipal Code, and California Energy Code (Title 24, Part 6

CCR) resulting in the same amount and intensity of lighting on the Spotorno Flat Area of the site. Therefore, the 39 Unit with Construction of the Bypass Road Alterative would have an increased impact on aesthetics, light, and glare compared to the proposed project, although impacts would remain less than significant with the implementation of mitigation.

### Air Quality and Greenhouse Gas Emissions

Although this alternative would develop the same number of homes on the same area of the site, the construction of the Bypass Road would result in greater construction emissions due to surface grading and construction activity. The resulting construction emissions, in combination with the construction of the 39 units, would be greater than those caused by the proposed project. This alternative would also generate more daily vehicle trips (AM peak, PM peak, and weekend) than the proposed project and therefore would increase operational emissions of criteria pollutants, toxic air contaminants, and GHG emissions. The increase in daily trip generation would increase the severity of the proposed project's air quality and GHG emissions impacts. Therefore, the 39 Unit with Construction of the Bypass Road Alternative would have a greater impact on air quality/GHG emissions than the proposed project, although impacts would remain less than significant with the implementation of mitigation.

### Biological Resources

Under this alternative, construction of the Bypass Road would disturb more ground and remove a larger area of potential habitat and hillside vegetation than the proposed project. These ground-disturbing activities would be similar to the proposed project, and mitigation identical to the proposed project would be implemented. Therefore, the 39 Unit with Construction of the Bypass Road Alternative would have greater biological resource impacts than those of the proposed project.

### Cultural Resources

Under this alternative, construction of the Bypass Road would disturb more ground over a larger area than the proposed project. These ground-disturbing activities would be similar to the proposed project but would occur over a larger area due to the construction of the Bypass Road. As a result, the increase in ground-disturbing area would increase chances of disturbing cultural resources. However, mitigation identical to the proposed project would be implemented which would reduce impacts to a less than significant level. The 39 Unit with Construction of the Bypass Road Alternative would create a greater likelihood of encountering cultural resource, and thus would have cultural resource impacts greater than the proposed project before mitigation.

### Geology, Soils, and Seismicity

Under this alternative, construction of the Bypass Road would disturb more ground over a larger area than the proposed project. These ground-disturbing activities would be similar to the proposed project but would occur over a larger area and within an area with steeper slopes due to the construction of the Bypass Road. As a result, the increase in ground-disturbing area would result in greater impacts to geology, soils, and seismicity. However, mitigation similar to the proposed project would be implemented which would reduce impacts to a less than significant level. The 39 Unit with Construction of the Bypass Road Alternative would create a higher likelihood of impacts related to

geology, soils, and seismicity, and thus would have greater impacts to geology, soils, and seismicity than the proposed project before mitigation.

### Hazards and Hazardous Material

As with the proposed project, this alternative would not create a significant hazard to the public or environment related to the transport, use, or storage of hazardous materials, nor would it emit hazardous emissions. Similar to the proposed project, this alternative would not require the implementation of mitigation associated with the demolition and removal of existing structures from the site because there are no existing structures. The 39 Unit with Construction of the Bypass Road Alternative would have hazards and hazardous materials impacts similar to the project.

### Hydrology and Water Quality

With construction of the Bypass Road, this alternative would result in additional impervious surfaces in the Happy Valley Area. Construction activities would require mitigation similar to the project for water quality impacts, as well as compliance with the SWRCB General Permit. The construction of the bypass would still not result in significant impacts to water quality, groundwater, drainage, flood zones, dam failure, or inundation. This alternative would develop the same amount of acres as the proposed project and be required to comply with the Alameda County Clean Water Program, City of Pleasanton Municipal Code, and State Water Board General Permit. Compliance with these agencies and policies would reduce impacts to less than significant. Therefore, the 39 Unit with Construction of the Bypass Road Alternative would have impacts on Hydrology similar to those of the proposed project.

### Land Use and Planning

This alternative would include development of the same number of residential units as the proposed project. In addition, this alternative would include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect the Spotorno Flat Area to the Foley property to the east, and Lund Ranch. However, this alternative includes construction of the Bypass Road that, although consistent with the Specific Plan, could conflict with Measures PP and QQ if it is constructed on slopes of 25 percent or greater. Because the Bypass Road has not been designed, further analysis would need to be conducted in order to fully determine the Bypass Road's impacts. . Therefore, land use impacts for this alternative would likely be greater than the proposed project.

### Noise

Construction noise impacts under this alternative would be greater than those under the project because of the additional construction site for the Bypass Road. As with the project, mitigation would be required to ensure that construction noise impacts are less than significant. This alternative would generate the same number of daily vehicle trips as the project (see Transportation below), but trips would be distributed onto different streets, notably Sycamore Creek Way. Because the number of trips does not cause a traffic impact or a significant increase in the number of cars, noise would not exceed the ambient daily noise levels. With the mitigations in Section 3.10, Noise,

this alternative would have noise impacts similar to the project; impacts would be less than significant with the incorporation of mitigation under both scenarios.

### Public Services

Under this alternative, the same amount people would be living or visiting the site on a daily basis, and there would be a similar demand for fire and police protection. In addition, this alternative would result in the same number of new students compared to the proposed project, which would not create a significant impact to public school services. Furthermore, this alternatives projected population increase would result in a similar demand for local parks. Therefore, the 39 Unit with Construction of the Bypass Road Alternative would result in similar impacts to public services.

### Transportation and Traffic

Under this alternative, the same number of homes would be constructed resulting in the same net trips. However, the Bypass Road would distribute peak-hour trips differently than the proposed project. Construction of the Bypass Road as depicted in the HVSP would include the construction of the cul-de-sac at the south end of Westbridge Lane and would direct all of the golf course traffic and all of the project traffic to the Bypass Road and Sycamore Creek Way, shifting the main access for traffic to the freeway away from Sycamore Road to Sycamore Creek Way that would reduce the amount of traffic travelling on Happy Valley Road. Table 3.12-7 in the Transportation and Traffic section of this SEIR shows the shift in the amounts and percentage changes in project-generated traffic to the different roadways with the construction of the Bypass Road in comparison to the distribution of project traffic with the proposed project. The implementation of the Bypass Road would not cause a more significant traffic impact at the study intersections than the proposed project. Although more traffic will be added to Sycamore Creek Way, the intersection of that street with Sycamore Road will continue to operate at an acceptable level of service, LOS B, with the addition of project traffic. Therefore, this alternative would result in impacts to transportation and traffic similar to the proposed project.

### Utilities and Service Systems

This alternative would result in the same amount of single-family homes and as a result, the same demand for water and energy and generation of wastewater and solid waste. Utilities and service systems would still be able to meet the demands of residents under this alternative. Therefore, the 39 Unit with Construction of the Bypass Road Alternative would result in the same number of residential units and impacts to utilities and service systems similar to the proposed project.

## 5.5.2 - Conclusion

The 39 Unit with Construction of the Bypass Road Alternative would result in similar impacts to, hazards, hydrology, noise, public services, transportation and traffic, and utilities. The 39 Unit with Construction of the Bypass Road Alternative would have greater impacts than the proposed project to other resource areas (e.g., aesthetics, air quality and GHG emissions, geology and soils, biological resources, cultural resources, and land use and planning).

The 39 Unit with Construction of the Bypass Road Alternative would advance the following objectives to a degree equivalent to the proposed project:

- Create a high-quality, single-family residential neighborhood that complements the semi-rural character of Happy Valley.
- Provide for an appropriate transition between the Callippe golf course community and the adjacent residential neighborhoods within Pleasanton.
- Preserve the hillside areas of the Spotorno property as undeveloped, publicly-accessible open space with adequate connections to the broader trails network.
- Implement transportation improvements and residential developments in conformance with the Happy Valley Specific Plan and as allowed by the subsequent measures PP and QQ.

## 5.6 - Environmentally Superior Alternative

The qualitative environmental effects of each alternative in relation to the proposed project are summarized in Table 5-1. Findings rejecting alternatives are required only if one or more significant environmental effects will not be avoided or substantially lessened by mitigation measures. Accordingly, the City need not make findings rejecting alternatives described in the SEIR where all of the project's significant impacts will be avoided or substantially lessened by mitigation measures. (See *Laurel Hills Homeowners Ass'n v City Council* (1978) 83 Cal.App.3d 515 [if mitigation measures substantially lessen a project's significant environmental effects, the lead agency may approve the project without making findings on the feasibility of the SEIR's project alternatives]; see also *Stevens v City of Glendale* (1981) 125 Cal.App.3d 986, 996; *No Slo Transit, Inc. v City of Long Beach* (1987) 197 Cal.App.3d 241].) Thus, if the City finds that significant adverse effects will be avoided or substantially lessened by mitigation measures, it need not make findings that environmentally superior alternatives are infeasible. (See *Mira Mar Mobile Community v City of Oceanside* (2004) 119 Cal.App.4th 477; *Protect Our Water v County of Merced* (2003) 110 Cal.App.4th 362, 373; *Kings County Farm Bureau v City of Hanford* (1990) 221 Cal.App.3d 692.).

The comparison contained in Table 5-1 and the subsequent discussion are provided for informational purposes only.

**Table 5-1: Summary of Alternatives**

| Environmental Topic Area | No Project/No Build Alternative | 22 Lot Development Alternative | 39 Unit with Bypass Road Alternative |
|---|---|---|---|
| Aesthetics, Light, and Glare | Less impact | Similar impact | Greater impact |
| Air Quality | Less impact | Similar impact | Greater impact |
| Biological Resources | Less impact | Similar impact | Greater impact |
| Cultural Resources | Less impact | Similar impact | Greater impact |
| Geology and Soils | Less impact | Similar impact | Greater impact |

**Table 5-1 (cont.): Summary of Alternatives**

| Environmental Topic Area | No Project/No Build Alternative | 22 Lot Development Alternative | 39 Unit with Bypass Road Alternative |
|---|---|---|---|
| Greenhouse Gas Emissions | Less impact | Similar impact | Greater impact |
| Hazards and Hazardous Materials | Less impact | Similar impact | Similar impact |
| Hydrology and Water Quality | Less impact | Similar impact | Similar impact |
| Land Use and Planning | Less impact | Similar impact | Greater impact |
| Noise | Less impact | Similar impact | Similar impact |
| Public Services | Less impact | Less impact | Similar impact |
| Transportation and Traffic | Less impact | Less impact | Similar impact |
| Utilities and Service System | Less impact | Less impact | Similar impact |
| Source: FirstCarbon Solutions, 2018. | | | |

As shown in Table 5-1, the No Project/No Build Alternative is the environmentally superior alternative, since it would avoid or substantially lessen the project's potentially significant impacts and would avoid the need for any mitigation measures.

CEQA Guidelines Section 15126(e)(2) requires an EIR to identify an environmentally superior alternative. If the No Project Alternative is the environmentally superior alternative, the EIR must also identify an environmentally superior alternative from among the other alternatives.

For purposes of discussion only, of the two remaining alternatives, the No Project, 22 Lot Development Alternative has the potential to yield the greatest reductions in the severity of the proposed impacts associated with transportation and traffic because there would be fewer residents and project generated trips. Therefore, 22 Lot Development Alternative is the environmentally superior alternative.

## 5.7 - Alternatives Rejected From Further Consideration

The following alternatives were initially considered, but were rejected from further consideration for the reasons described below.

### 5.7.1 - Develop MDR Designated Part of Site

This alternative that was initially considered involved developing the Medium Density Residential (MDR) area of the upper portion of the project site as designated by the HVSP. Such an alternative would result in the development of 75 housing units. Although, this alternative would be consistent with HVSP land use designations, development of 75 units in this area of the site would not comply with Measures PP and QQ. In addition, this alternative would increase demand for public services, consumption of water and energy, and generation of wastewater and solid waste. Furthermore, this alternative would be expected to significantly increase daily and peak-hour trip generation, which

could create significant and unavoidable impacts associated with air quality and GHG emissions, noise, and transportation. In this sense, it would yield no fewer environmental impacts than any of the alternatives discussed above. For these reasons, the Development of the designated MDR part of the site was eliminated from further consideration.

### 5.7.2 - 22 Lot Development on SRDR Portion with 10 Unit Development on MDR Portion of Project Site

This alternative was also considered to develop 22 housing units on the Spotorno Flat Area portion of the project site currently designated Semi-Rural Residential (SRDR) as well as 10 housing units on the area of the project site designated Medium Density Residential (MDR) in the HVSP. Such an alternative would also be consistent with the HVSP land use designations and would comply with Measure PP/QQ, which provides an exemption from the slopes/ridgelines development prohibition where 10 or fewer units are proposed. Although this alternative would involve less development than the proposed project, it would not further all the project objectives. Furthermore, it would yield no fewer environmental impacts than any of the alternatives discussed above, since an access road to the upper lots would need to be constructed. For these reasons, the 22 Lot Development on the SRDR portion with 10 unit Development on the MDR Portion of the project site alternative was eliminated from further consideration.

### 5.7.3 - Alternate Location

An Alternate Location Alternative was considered to develop the proposed project on a different project site within the City of Pleasanton. Such an alternative would avoid all potential environmental impacts on the project site. However, development elsewhere could result in potentially significant impacts depending on the alternate location project site as well as not fulfilling all project objectives. As a result, this alternative would yield no better conclusions that any of the other alternatives discussed previously. Therefore, an Alternate Location Alternative was eliminated from further discussion.

# SECTION 6: OTHER CEQA CONSIDERATIONS

## 6.1 - Significant Unavoidable Impacts

CEQA Guidelines Section 15126.2(a)(b) requires an EIR to identify and focus on the significant environmental effects of the proposed project, including effects that cannot be avoided if the proposed project were implemented.

The proposed project would not result in any significant unavoidable impacts, as all impacts can be mitigated to less than significant.

## 6.2 - Growth-Inducing Impacts

There are two types of growth-inducing impacts that a project may have: direct and indirect. To assess the potential for growth-inducing impacts, the project's characteristics that may encourage and facilitate activities that individually or cumulatively may affect the environment must be evaluated (CEQA Guidelines Section 15126.2(d)).

Direct growth-inducing impacts occur when the development of a project imposes new burdens on a community by directly inducing population growth, or by leading to the construction of additional developments in the same area. Also included in this category are projects that remove physical obstacles to population growth (such as a new road into an undeveloped area or a wastewater treatment plant with excess capacity that could allow additional development in the service area). Construction of these types of infrastructure projects cannot be considered isolated from the development they facilitate and serve. Projects that physically remove obstacles to growth, or projects that indirectly induce growth may provide a catalyst for future unrelated development in an area such as a new residential community that requires additional commercial uses to support residents.

The project would develop 39 single-family detached homes and related on- and off-site improvements on approximately 31 acres. The project would be expected to result in a population of 106 persons (2.72 per household).[1] Conservatively assuming that all 106 persons would be new to the City of Pleasanton, the project's population would represent a nominal 0.14 percent of the City's total incorporated population of 75, 916 as reported by the California Department of Finance in 2017. This amount is considered negligible, and, therefore, direct population growth would be less than significant.

Consistent with the City General Plan and HVSP, the project would develop the site to ensure logical and orderly growth. As discussed in Section 3.9, Land Use and Planning, the project would adhere to General Plan density requirements and the City's general policy of protecting and preserving open space. The project is also designed to achieve HVSP growth objectives and policies, which includes development standards and design guidelines.

[1] City of Pleasanton. 2008. Genera Plan EIR. Page S-19.

Additionally, while urban infrastructure would be extended only to 31 acres of the 154-acre site, adjacent areas would remain as permanent agricultural open space, thereby prohibiting further expansion. The project's proposal to permanently preserve and protect the vast majority of the project site for agricultural open space would further ensure that no additional urban expansion would occur. As such, development of the project would not remove a physical barrier to growth. No impact would occur.

## 6.3 - Mandatory Findings of Significance

The environmental effects of the project are summarized in Section ES, Executive Summary, and area analyzed in detail in Section 3, Environmental Impact Analysis of this Subsequent EIR (SEIR).

As mandated by the CEQA Guidelines, the SEIR must address any significant irreversible environmental change that would result from implementation of the proposed project. Specifically, pursuant to the CEQA Guidelines (Section 15126.2(c)), such an impact would occur if:

- The project would involve a large commitment of nonrenewable resources;
- Irreversible damage can result from environmental accidents associated with the project; and
- The proposed consumption of resources is not justified (e.g., the project results in the wasteful use of energy).

The proposed project consists of the development of 39 single-family detached homes and related on- and off-site improvements on approximately 31 acres. Construction debris recycling practices would be expected to allow for the recovery and reuse of building materials such as concrete, lumber, and steel and would limit disposal of these materials, some of which are non-renewable.

Day-to-day activities would involve the use of non-renewable resources such as petroleum and natural gas during operations. The new residential uses would be required to adhere to the latest adopted edition of the California Building Standards Code, which includes a number of standards that would reduce energy demand, water consumption, wastewater generation, and solid waste generation that would collectively reduce the demand for resources. This would result in the emission and generation of less pollution and effluent and lessen the severity of corresponding environmental effects. Although the project would result in an irretrievable commitment of nonrenewable resources, the commitment of these resources would not be significantly inefficient, unnecessary, or wasteful. Furthermore, the proposed residential uses do not have the potential to cause significant environmental accidents through releases into the environment, as they would not involve large quantities of hazardous materials.

## 6.4 - Energy Conservation

Public Resources Code Section 21100(b)(3) and CEQA Guidelines Section 15126.4 require EIRs to describe, where relevant, the wasteful, inefficient, and unnecessary consumption of energy caused by a project. In 1975, largely in response to the oil crisis of the 1970s, the State Legislature adopted Assembly Bill (AB) 1575, which created the California Energy Commission (CEC). The statutory mission of the CEC is to forecast future energy needs, license thermal power plants of 50 megawatts

or larger, develop energy technologies and renewable energy resources, plan for and direct State responses to energy emergencies, and—perhaps most importantly—promote energy efficiency through the adoption and enforcement of appliance and building energy efficiency standards. AB 1575 also amended Public Resources Code Section 21100(b)(3) to require EIRs to consider the wasteful, inefficient, and unnecessary consumption of energy caused by a project. Thereafter, the State Resources Agency created Appendix F of the CEQA Guidelines. Appendix F is an advisory document that assists EIR preparers in determining whether a project will result in the inefficient, wasteful, and unnecessary consumption of energy. For the reasons set forth below, this SEIR concludes that the proposed project will not result in the wasteful, inefficient, and unnecessary consumption of energy, will not cause the need for additional natural gas or electrical energy-producing facilities, and, therefore, will not create a significant impact on energy resources.

## 6.4.1 - Regulatory Setting

Federal and state agencies regulate energy use and consumption through various means and programs. At the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency are three federal agencies with substantial influence over energy policies and programs. Generally, federal agencies influence and regulate transportation energy consumption through establishment and enforcement of fuel economy standards for automobiles and light trucks, through funding of energy-related research and development projects, and through funding for transportation infrastructure improvements. At the State level, the California Public Utilities Commission (CPUC) and the CEC are two agencies with authority over different aspects of energy. The CPUC regulates privately owned utilities in the energy, rail, telecommunications, and water fields. The CEC collects and analyzes energy-related data, prepares statewide energy policy recommendations and plans, promotes and funds energy efficiency programs, and adopts and enforces appliance and building energy efficiency standards. California is exempt under federal law from setting state fuel economy standards for new on-road motor vehicles. Some of the more relevant federal and state energy-related laws and plans are discussed below.

### Federal Energy Policy and Conservation Act

The Federal Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, which is part of the United States Department of Transportation, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 miles per gallon. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 miles per gallon. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is not determined for each individual vehicle model; rather, compliance is determined on the basis of each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The Corporate Average Fuel Economy (CAFE) program, which is administered by United States Environmental Protection Agency, was created to

determine vehicle manufacturers' compliance with the fuel economy standards. The United States Environmental Protection Agency calculates a CAFE value for each manufacturer, based on city and highway fuel economy test results and vehicle sales. On the basis of the information generated under the CAFE program, the United States Department of Transportation is authorized to assess penalties for noncompliance. In the course of its over 30-year history, this regulatory program has resulted in vastly improved fuel economy throughout the nation's vehicle fleet.

### Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs) such as ABAG were required to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values that were to guide transportation decisions in that metropolitan area. The planning process for specific projects would then address these policies. Another requirement was to consider the consistency of transportation planning with federal, state, and local energy goals. Through this requirement, energy consumption was expected to become a decision criterion, along with cost and other values that determine the best transportation solution.

### The Transportation Equity Act for the 21st Century (TEA-21)

The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

### State of California Energy Plan

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies a number of strategies, including providing assistance to public agencies and fleet operators, encouraging urban designs that reduce vehicle miles traveled, and accommodating pedestrian and bicycle access.

### Title 24, Energy Efficiency Standards

Title 24, which was promulgated by the CEC in 1978 in response to a legislative mandate to create uniform building codes to reduce California's energy consumption, provides energy efficiency standards

for residential and nonresidential buildings. According to the CEC, since the energy efficiency standards went into effect in 1978, it is estimated that California residential and nonresidential consumers have reduced their utility bills by at least $15.8 billion. The CEC further estimated that by 2011, residential and nonresidential consumers will have saved an additional $43 billon in energy costs.

For each year of construction, in both newly constructed buildings and alterations to existing buildings, the 2013 Standards (for residential and nonresidential buildings) were expected to reduce the growth in electricity use by 555.5 gigawatt-hours per year (GWh/y) and to reduce the growth in peak electrical demand by 148.4 megawatts. The 2013 Standards were also expected to reduce the growth in natural gas use by 7.04 million therms per year (therms/y) beyond the prior 2008 Standards. Overall, the 2013 Standards used 25 percent less energy for lighting, heating, cooling, ventilation, and water heating than the 2008 Standards.

For purposes of reference, single-family homes built to the newly adopted 2016 standards (which went into effect on January 1, 2017) will use about 28 percent less energy for lighting, heating, cooling, ventilation, and water heating than those built to the 2013 standards. In 30 years, California will have saved enough energy to power 2.2 million homes, reducing the need to build 12 additional power plants.

Because the adoption of Title 24 post-dates the adoption of AB 1575, it has generally been the presumption throughout the State that compliance with Title 24 (as well as compliance with the federal and State regulations discussed above) ensures that projects will not result in the inefficient, wasteful, and unnecessary consumption of energy. As is the case with other uniform building codes, Title 24 is designed to provide certainty and uniformity throughout the State while ensuring that the efficient and non-wasteful consumption of energy is carried out through design features. Large infrastructure transportation projects that cannot adhere to Title 24 design-build performance standards may, depending on the circumstances, undertake a more involved assessment of energy conservation measures in accordance with some of the factors set forth in Appendix F of the CEQA Guidelines. As an example, pursuant to the California Department of Transportation CEQA implementation procedures and FHWA Technical Advisory 6640.8A, a detailed energy study is generally only required for large-scale infrastructure projects. However, for the vast majority of residential and nonresidential projects, adherence to Title 24 is deemed necessary to ensure that no significant impacts occur from the inefficient, wasteful, and unnecessary consumption of energy. As a further example, the adoption of federal vehicle fuel standards, which have been continually improved since their original adoption in 1975, have also protected against the inefficient, wasteful, and unnecessary use of energy.

## 6.4.2 - Energy Requirements of the Proposed Project

Short-term construction and long-term operational energy consumption are discussed below.

### Short-term Construction

Development of the project would include short-term construction activities that would consume energy, primarily in the form of diesel fuel (e.g., mobile construction equipment) and electricity (e.g., power tools). Construction activities would be subject to applicable regulations such as anti-idling

measures, limits on duration of activities, and the use of alternative fuels, thereby reducing energy consumption.

There are no aspects of the project that would foreseeably result in the inefficient, wasteful, or unnecessary consumption of energy during construction activities. For example, there are no unusual characteristics that would directly or indirectly cause construction activities to be any less efficient that would otherwise occur elsewhere (restriction on equipment, labor, types of activities, etc.).

In summary, the project would not result in the inefficient, wasteful, or unnecessary consumption of energy during construction activities.

## Long-term Operations

### *Transportation Energy Demand*

Vehicle fuel efficiency is regulated at the federal level. Pursuant to the Federal Energy Policy and Conservation Act of 1975, the National Highway Traffic Safety Administration (NSHTA) is responsible for establishing additional vehicle standards and for revising existing standards. As of 2018, NSHTA indicated that fuel economy of passenger vehicles averaged 45 miles per gallon and light trucks averaged 37 miles per gallon.

Annual transportation fuel consumption for the project is summarized in Table 6-1. As shown, the annual fuel consumption for the Project is estimated to be 30,644 gallons.

**Table 6-1: Approximate Transportation Fuel Consumption Estimate**

| Vehicle Classification | Fleet Percentage | Annual Vehicle Miles Traveled | Average Fuel Economy | Annual Fuel Consumption (gallons) |
|---|---|---|---|---|
| Passenger | 55.8% | 473,987 | 45.21 | 10,484 |
| Light Duty Truck/Sport Utility Vehicle | 34.2% | 290,508 | 37.36 | 7,775 |
| Medium Duty Truck/Heavy Duty Truck/Bus/Other | 9.4% | 79,847 | 6.5 | 12,284 |
| Motorcycle | 0.6% | 5,096 | 50.0 | 101 |
| **Total** | **100.0%** | **849,438** | **—** | **30,644** |

Notes:
Fleet percentages obtained from CalEEMod operational output
[1] Includes Light-Duty Auto (LDA)
[2] Includes Light Duty Truck 1 (LDT1) and Light Duty Trucks 2 (LDT2) and Medium Duty Vehicles (MDV)
[3] Includes Light Heavy Duty (LHD), Medium Heavy Duty (MHD), and Heavy Heavy Duty Trucks (HHD), Other Bus (OBUS), Urban Bus (UBUS), School Bus (SBUS, and Motor Home (MH)
[4] Includes Motorcycles
Source: FirstCarbon Solutions, 2015.
Source: FCS, 2018.

The project is located directly adjacent to a suburban area and accommodates bicycle as well as pedestrian access to adjacent area. In summary, the project would not result in the inefficient, wasteful, or unnecessary consumption of transportation energy during operational activities.

### Building Energy Demand

As discussed in Section 3.14, Utilities, the Project would demand an estimated 315,532 million kilowatt-hours of electricity and 3 million cubic feet of natural gas on an annual basis. The Project would be required to comply with the Pleasanton Climate Action Plan and General Plan Energy Element. The CAP and General Plan contain energy conservation as well as reduction measures. In addition, the proposed Project would be subject to the most recently adopted edition of the Title 24 energy efficiency standards at the time building permits are sought. Conformance to Title 24, along with energy conservation and reduction measures, ensures that the project is as energy-efficient as possible. Therefore, the project would not result in the unnecessary, wasteful, or inefficient use of building energy during operational activities.

## 6.5 - Vehicle Miles Traveled

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) has updated California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016, which incorporated public comments from the August 2014 guidelines. OPR released final proposed Guidelines on November 27, 2017. The final proposed Guidelines include a new Section 15064.3 on vehicle miles of travel (VMT) analysis and thresholds. OPR also released a Technical Advisory on Evaluating Transportation Impacts in CEQA. New Guidelines Section 15064.3 states that they do not take effect until January 1, 2020 unless the lead agency adopts them earlier. Neither the City of Pleasanton nor the Alameda CTC has established any standards or thresholds on VMT. Therefore, the new guidelines have not yet been adopted and are not in effect at this time.

The final guidelines may change based on the comments received during the Natural Resources Agency formal administrative rulemaking process for adoption under the Administrative Procedure Act. Since there are no standards in effect on VMT analysis, a preliminary assessment of the VMT generated by the proposed project was prepared for information and disclosure purposes only. No determination on the significance of VMT impacts is made in this document since none is legally required.

### 6.5.1 - Analysis Methods

To estimate VMT within the City of Pleasanton, both without and with the project, Fehr & Peers used the City of Pleasanton Travel Demand Model as well as information from the Metropolitan Transportation Commission (MTC). The City of Pleasanton model was used to estimate average trip lengths for the proposed project as well as calculate a citywide average, while MTC data was used to establish average residential trip lengths for the region. The citywide average VMT per household estimate using the City of Pleasanton model was within four percent of the citywide average calculated using the MTC model. The results are presented in Table 6-2.

**Table 6-2: Existing Average VMT**

| Land Use Type | Project | Project with Bypass Road | City of Pleasanton | Regional |
|---|---|---|---|---|
| Home Based VMT per Capita | 35.3 | 35.7 | 17.7 | 15.3 |
| Source: Fehr & Peers, 2018; MTC 2018. http://analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita | | | | |

The existing average home-based trip lengths for Pleasanton are slightly higher than the regional average; home based trips are defined as trips that have at least one trip end at home, including trips from home to work, school, shopping, or other purposes. Estimated VMT per capita for the proposed project is expected to be higher than either the citywide or the regional average. This is primarily due to the project's location where there are limited opportunities for walk, bicycle or transit trips, and its distance from the regional roadway network.

## 6.5.2 - Analysis Results

Results of the VMT analysis indicate that the project would contribute to an increase in vehicle miles of travel on a per-capita basis as the project adds a housing development that would require residents to travel longer-than-average distances to meet their daily needs.

# SECTION 7: EFFECTS FOUND NOT TO BE SIGNIFICANT

## 7.1 - Introduction

This section is based on the Notice of Preparation (NOP), dated April 7, 2017, and contained in Appendix A of this Subsequent Environmental Impact Report (SEIR). The NOP was prepared to identify the potentially significant effects of the proposed projects and was circulated for public review between April 7, 2017 and May 8, 2017. In the course of this evaluation, certain impacts were found to be less than significant because the proposed project's characteristics would not create such impacts. This section provides a brief description of effects found not to be significant or less than significant, based on the NOP comments or more detailed analysis conducted as part of the EIR preparation process. Note that a number of impacts that are found to be less than significant are addressed in the various SEIR topical sections (Sections 3.1 through 3.14) to provide more comprehensive discussion of why impacts are less than significant, in order to better inform decision-makers and the general public.

## 7.2 - Effects Found not to be Significant

### 7.2.1 - Agriculture

The project site overlaps with three land use/zoning districts: Planned Unit Development—Medium Density Residential (PUD-MDR); Planned Unit Development—Semi-Rural Density Residential (PUD-SRDR); and Planned Unit Development—Agriculture/Open Space (PUD-AG/OS) pursuant to the Happy Valley Specific Plan. The project site is not located on Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; furthermore, the project site does not contain nor is it adjacent to any forest land.[1] The project area is not designated by a Williamson Act contract and is deemed a Non-Williamson Act Land.[2] The project would not convert agricultural lands to non-agricultural uses and no impacts would occur. Although some agricultural land would be converted to development, it would be less than was studied in the HVSP FEIR because of the elimination of the MDR lots and the Bypass Road.

### 7.2.2 - Hazards

#### Exposure of Schools to Hazardous Materials or Emissions

The closest school to the project site is Village High School, located 1.4 miles to the north at 4645 Bernal Avenue. Small quantities of hazardous materials would be used on-site during construction and operation of the project, however, not in sufficient quantities to create significant hazard. Project construction would not have the potential to emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school, and as a result, there would be no impact from construction or operation.

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[1] California Department of Conservation, California Important Farmland Finder. Website: http://maps.conservation.ca.gov /ciff/ciff.html. Accessed February 7, 2017

[2] California Department of Conservation, Division of Land Resource Protection, Alameda County. Website: ftp://ftp.consrv.ca.gov/ pub/dlrp/wa/Alameda_14_15_WA.pdf. Accessed February 8, 2017

### d–e) Public and Private Airstrips

As described previously, the project site is not located in an airport influence zone as delineated in the Livermore Municipal Airport Master Plan. The nearest airport, Livermore Municipal Airport, is roughly 4.9 miles northeast of the project site. Given the distance of the project site from the nearest local airport, and applicable air traffic and safety regulations, the project would result in no impact with respect to air safety hazards.

The closest private airstrip is the Meadowlark Field Airport, located approximately 9.6 miles east of the project site. Given the distance of the project site from this airport, and applicable air traffic and safety regulations, the project would result in a less than significant impact with respect to air safety hazards at or near a private airstrip.

## 7.2.3 - Mineral Resources

The Pleasanton General Plan Map identifies approximately 1,750 acres of regionally significant sand and gravel deposits in the eastern portion of the City. The area is located east of Martin Avenue, west of Isabel Avenue, and north of Vineyard Avenue and is designated as an "Aggregate Resource Area of Regional Significance." Cemex operates the Elliot facility, a 966-acre mining operation within the designated resource area.

The project site currently consists of mostly undeveloped grassland with a windmill that powers irrigation well in the west corner of the project site near Alisal Street. The project site is enclosed by a barbed-wire fence, with a gated access point located near the Faith Chapel Assembly of God church. Cattle are grazed on the hilly portion of the site. The project site is approximately 3.45 miles southwest of the Elliot mining facility and is not located within any other known mineral resource area.[3]

The HVSP envisions the project site, located in the Spotorno Flat Area, for Planned Unit Development—Semi Rural Density Residential. This land use designation allowed for the development of future residential housing. As a result, mineral resource operations are not expected to occur within the HVSP. Impacts related to mineral resources would not occur.

## 7.2.4 - Population and Housing

The project involves the construction of 39 single-family residential units within the Greater Happy Valley Subarea of the HVSP, which includes approximately 31-acres of the Spotorno Flat Area, bounded to the west and south by Alisal Street and Westbridge Lane, respectively. The Subarea is zoned as Planned Unit Development—Semi-Rural Density Residential and allows for a maximum of 69 potential new homes. As described in Section 2, Project Description, the proposed project would result in a net 58 units fewer than contemplated in the HVSP. Furthermore, it is expected that construction workers would be drawn from the local labor pool within the greater Bay Area and, therefore, would not indirectly induce substantial growth.[4] Therefore, impacts would be less than significant.

[3] City of Pleasanton 2005 General Plan 2025, Figure 7-2 Aggregate Resources and Reclamation, page 7-12, July 2009
[4] City of Pleasanton Happy Valley Specific Plan, Table V-1 Housing Summary by PUD District, page 25, June 1998.

The entire project site is undeveloped within approximately 31-acres of the Spotorno Flat Area, which was previously used for agricultural grazing. No existing residential units or people are living on-site; therefore, the project would not displace significant numbers of housing units or residents. As a result, replacement housing would not need to be constructed. Furthermore, this project would result in a net increase of 39 housing units compared to existing conditions. Therefore, no impacts to housing would occur.

## 7.2.5 - Recreation

The City of Pleasanton's park system consists of 26 neighborhood parks totaling about 133 acres, and 14 community parks totaling approximately 209 acres. The City currently provides about 5.1 acres of improved neighborhood and community parks per 1,000 people, slightly above the national standard of five acres per 1,000 .[5] The closest neighborhood park to the project site is the Mission Hills Park on Junipero Drive. The nearest community park is Amador Valley Community Park, located at Santa Rita Road and Black Avenue. The closest regional park facility is the southeastern portion of Pleasanton Ridgelands Regional Park.[6] Additionally, the Callippe Reserve Golf Course is located immediately south of the project site within the HVSP. The Happy Valley Specific Plan identifies the Spotorno Flat Area Trail (number 4 on the HVSP Trails Plan exhibit) within the Spotorno property area. In addition, the HVSP identifies two other trails within the Spotorno property area: the "Bypass Road Trail" (number 3 on the HVSP Trails Plan exhibit), and the "Spotorno MDR/Foley Ranch Trail connection" (number 7A on the exhibit), which would connect from the Bypass Road trail, to the east.[7]

As described previously, the project would consist of rezoning and subdividing to support 39 single-family residential home sites on approximately 31 acres and the permanent preservation of approximately 80 acres as agricultural open space. The project is consistent with the population and housing thresholds envisioned for the HVSP. Furthermore, as discussed in the HVSP FEIR, the open space provided within the HVSP affords residences within the HVSP with additional recreational opportunities that are not by definition considered within the City's park system. The project would also include public trails, as described in more detail in Section 3.12, Transportation. In addition, the developer of the project may pay in-lieu park fees for development of parks elsewhere in the City to assist in providing sufficient park acreage.[8] Therefore, the project would not increase the severity of impacts for recreational facilities than those previously analyzed in the HVSP FEIR.

[5] City of Pleasanton 2005 General Plan 2035, Chapter 6 Public Facilities and Community Programs 'Parks and Recreation' page 6-5, July 2009.
[6] City of Pleasanton Happy Valley Specific Plan DEIR Chapter 3 M. Public Services: Recreation and Parks, page 152, February 1998.
[7] City of Pleasanton Happy Valley Specific Plan DEIR, Chapter 3 M. Public Services: Recreation and Parks, page 150, February 1998.
[8] City of Pleasanton Happy Valley Specific Plan DEIR, Chapter 3 M. Public Services: Recreation and Parks, page 153-154, February 1998.

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# SECTION 8: PERSONS AND ORGANIZATIONS CONSULTED/LIST OF PREPARERS

## 8.1 - Persons and Organizations Consulted

### 8.1.1 - Lead Agency

**City of Pleasanton**

***Community Development Department***

Associate Planner ..... Jenny Soo
Planning Manager ..... Ellen Clark
City Traffic Engineer ..... Mike Tassano

***Fire Department***

Fire Admin Supervisor ..... Darci Vogel
Fire Chief ..... Ruben Torres

***Police Department***

Police Chief ..... Dave Spiller

### 8.1.2 - Public Agencies

**State Agencies**

***Native American Heritage Commission***

Associate Governmental Program Analyst ..... Frank Lienart

## 8.2 - List of Preparers

### 8.2.1 - Lead Agency

**City of Pleasanton**

Associate Planner ..... Jenny Soo
Planning Manager ..... Ellen Clark

### 8.2.2 - Lead Consultant

**FirstCarbon Solutions**

Project Director ..... Mary Bean
Project Manager ..... Elizabeth Johnson
Legal Counsel ..... Tracy Inscore
Senior Noise Analyst ..... Phil Ault
Air Quality Scientist ..... Ella Li
Senior Biologist ..... Brian Mayerle
Biologist ..... Robert Carroll

Cultural Resources Specialist ..... Dana DePietro, PhD
Assistant Project Manager ..... Ian Peterson
Assistant Project Manager ..... Liza Baskir
Environmental Analyst ..... Spencer Pignotti
Environmental Analyst ..... Chinmay Damle
Technical Editor ..... Ed Livingston
Word Processor ..... Ericka Rodriguez
GIS Technician ..... Karlee McCracken
Reprographics ..... Octavio Perez

## 8.2.3 - Technical Subconsultants

### Fehr & Peers

Project Manager ..... Kathrin Tellez
Project Engineer ..... Ben Fuller

### Kenneth L. Finger, PhD

Consulting Paleontologist ..... Kenneth L. Finger

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FIRSTCARBONSOLUTIONS™

# DRAFT
# Subsequent Environmental Impact Report
# Spotorno Ranch Project
# City of Pleasanton, Alameda County, California

## State Clearinghouse Number 2017042032

## APPENDICES


Prepared for:
**City of Pleasanton**
Community Development Department
200 Old Bernal Avenue
PO Box 520
Pleasanton, CA 94566
925.931.5615

Contact: Jenny Soo, Associate Planner

Prepared by:
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
925.357.2562

Contact: Mary Bean, Project Director
Elizabeth Johnson, Project Manager


Date: July 16, 2018

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# Appendix A: Notice of Preparation and Responses

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# A.1 - Notice of Preparation

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# City of Pleasanton
# Notice of Preparation and Notice of Public Scoping Meeting
# Spotorno Ranch Project

**Date:** Friday, April 7, 2017

**To:** Public Agencies and Interested Parties

**From:** Adam Weinstein, Planning Manager, City of Pleasanton

**Subject:** Notice of Preparation of a Subsequent Environmental Impact Report and Public Scoping Meeting

The City of Pleasanton will be the Lead Agency and will prepare a Subsequent Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project (Project), which involves construction of 39 single-family residential units and the preservation of approximately 123 acres of open space on a 158-acre site within the Happy Valley Specific Plan Area. The Subsequent EIR will use information in the Happy Valley Specific Plan EIR, which was certified in June 1998, but new baseline information will be collected and analysis will be conducted to reflect current conditions. The Project, its location, and potential environmental effects are described below. Pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15162, the City has determined that a Subsequent EIR is required for the Project and an Initial Study has not been prepared.

Public agencies and members of the general public are invited to provide comments in writing as to the scope and content of the Subsequent EIR. Specifically, the City would like to know the views of Responsible and Trustee Agencies as to the potentially significant environmental issues, reasonable alternatives, and mitigation measures that are germane to each agency's statutory responsibilities in connection with the Project. Responsible Agencies will need to use the Subsequent EIR prepared by the City when considering permits or other approvals for the Project.

Due to the time limits mandated by State law, responses must be sent at the earliest possible date, but no later than the close of the scoping period, which runs as follows: April 7, 2017 through May 8, 2017. Commenters are also encouraged to attend a public scoping session at the City of Pleasanton Planning Commission meeting on April 26, 2017 at 7:00 p.m. (200 Old Bernal Avenue).

Please send written responses to Jenny Soo at the address shown below. Public agencies providing comments are requested to include a contact person for the agency.

Jenny Soo, Associate Planner
City of Pleasanton
200 Old Bernal Avenue
Pleasanton, CA 94552
Email: jsoo@cityofpleasantonca.gov

# SPOTORNO RANCH PROJECT

## Project Location and Surrounding Uses

The Project site comprises three parcels (APNs 948-0015-002-01 and 949-0014-001-00) located in the southern portion of the City of Pleasanton, Alameda County, California. As shown in Exhibit 1, the site is roughly bounded by Alisal Street on the west, Westbridge Lane to the south and undeveloped hills to the east. The topography of the site is varied, with hills and ridgelines in the northern and eastern portions of the site (Spotorno Hill) and flat terrain in the west (Spotorno Flat). Surrounding land uses include large lot residential uses to the west, northwest and southwest; the Faith Chapel Assembly of God Church to the southwest; and the Callippe Preserve Golf Course to the south. The City's permanent urban growth boundary generally follows the alignment of Minnie Street as it passes the northern and northeastern portions of the site.

Vehicular access to the site is from Sycamore Road, via Sycamore Creek Way, and/or from Interstate 680 (I-680), via Happy Valley Road to a gated access point near the Faith Chapel Assembly of God Church on Alisal Street.

## Previous Planning Context

The City of Pleasanton adopted the Happy Valley Specific Plan (HVSP) in 1998 to guide future residential development within an 860-acre area generally located east of I-680 and south of Sycamore Road. The HVSP concept included development of an 18-hole golf course in the south of the plan area with up to 34 new large lot homes on the golf course property, as well as semi-rural density residential development in the western and central portions of the plan area and medium density residential development on 15 acres in the northeast of the plan area. The remaining hillside areas that surround Happy Valley were designated for agricultural and open space use. In total, up to 183 new residences were envisioned within the HVSP area, together with construction of a new "Bypass Road" linking Westbridge Lane with Sycamore Creek Way.

The HVSP allows for Semi-Rural Density Residential development (22 dwelling units) on the 31-acre Spotorno Flat area and Medium Density Residential development (75 dwelling units) on the 15-acre Upper Spotorno Valley of the Project site. Additionally, the HVSP requires the construction of the Bypass Road with development of the Spotorno site, primarily to divert golf-course traffic from Happy Valley Road.

## Project Description

The Project Applicant, Tim Lewis Communities, is proposing to rezone and subdivide the Project site to build 39 single-family residential lots and roadways on the 31-acre Spotorno Flat portion of the site and permanently preserve approximately 123 acres as open space. As shown on Exhibit 2, the area that would be developed is located on flat terrain in the western portion of the site in the vicinity of existing residential development, while the larger area to the east containing hilly terrain would be preserved as open space. Residential lots would range in size from 17,216 square feet

(0.39 acre) to 38,331 square feet (0.88 acre). Homes would be constructed in a variety of rural residential architectural styles. The proposed site plan includes preservation of an existing wetland area in the western portion of the site and the construction of an adjacent bio-retention area for on-site stormwater management. Please note that the site plan and associated physical elements of the project may undergo change in the coming months as the project is reviewed by staff and the Planning Commission.

The Project would also involve a number of changes to the circulation system. The Bypass Road envisioned in the HVSP to pass through the eastern portion of the site would not be constructed. A new street off of Westbridge Lane would be constructed, providing vehicular connections to five cul-de-sacs internal to the site. Concrete sidewalks 5 feet in width would be constructed along two internal streets and a 20-foot-wide link between the westernmost cul-de-sac and Alisal Street would provide access for emergency vehicles, bicycles and pedestrians. Additionally, the Spotorno Flat Area Trail called for in the HVSP (extending approximately east/west across the Spotorno Flat) would be constructed, but not the Spotorno MDR/Foley Ranch Trail Connection (which would extend east of the Bypass Road Trail). In addition, the Bypass Road Trail would be built, but likely not along the alignment called for in the HVSP.

The proposed Project requires the following discretionary approvals:

- ***General Plan Amendment—***The General Plan would be amended to: 1) change the maximum density and land use designations on the Spotorno Flat Area to allow the proposed 39 single-family homes in conjunction with major open-space land or agricultural/open space easement dedication; 2) refine the location of the Urban Growth Boundary; and 3) eliminate the Bypass Road.
- ***Specific Plan Amendment—*** The Specific Plan would be amended to: 1) eliminate the Bypass Road and keep Westbridge Lane as a permanent access road to Alisal Street; 2) change the land use designations to allow the proposed development; 3) change the maximum potential new residential units in the Spotorno Flat Area from 22 units to 39 units with major open space dedication, and 4) eliminate the Spotorno MDR/Foley Ranch Trail Connection, and change the alignment of the Bypass Road Trail.
- ***Planned Unit Development Rezoning and Development Plan—***The proposed Project would include rezoning the project site and constructing 39 homes and related improvements.
- ***Growth Management Allocation—***Pursuant to the City's Growth Management Ordinance (Pleasanton Municipal Code Chapter 17.36), the Project would require a Growth Management Allocation for the 39 proposed units. Approval of the allocation is at the City Council's discretion so long as the total annual citywide limit on new residential units for the year of application is not exceeded.
- ***Subsequent EIR Certification—***While the City certified an EIR for the HVSP that contemplated development on the Project site in 1998, the nature and location of the development proposed on the Project site differs materially from that analyzed previously in the HVSP EIR. As such, the City has determined that a Subsequent EIR is required.

## Probable Environmental Effects of the Project

The Subsequent EIR will evaluate potentially significant environmental impacts associated with the adoption and implementation of the Project. Consistent with the State CEQA Guidelines (Appendix G), the following environmental resource categories will be analyzed in relation to the Project:

- Aesthetics, Light, and Glare
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology, Soils, and Seismicity
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Public Services and Recreation
- Transportation
- Utilities and Service Systems
- Mandatory Findings of Significance

All of the resource categories listed above will be considered in the EIR; however, given the location and conditions on the Project site, the following issues will be central to the environmental analysis:

- ***Transportation and Traffic*—**The development of 39 single-family homes, the associated on-site circulation improvements, and the removal of the Bypass Road from the HVSP have the potential to generate new trips, alter traffic circulation patterns, create a need for roadway improvements, and increase the use of bicycle and pedestrian modes of transportation. The Subsequent EIR will quantify and assess potential impacts from the Project.
- ***Land Use*—**The Project would require amendments to the Pleasanton General Plan, HVSP, and Zoning Map. The Subsequent EIR will analyze the consistency of the proposed amendments with applicable City policy and regulations.
- ***Aesthetics and Visual Resources*—**A major objective of the HVSP is to preserve the semi-rural character of Happy Valley while allowing for the development of the golf course and additional homes. As such, the Subsequent EIR will evaluate changes in the visual character of the site and the surroundings that could result from the Project.
- ***Cumulative Effects*—**Close examination of the potential cumulative impacts of the Project related to air quality, greenhouse gas emissions and transportation will also be required.

In light of existing conditions on the Project site and the findings of the previous analysis in the HVSP EIR, it is anticipated that the following resource categories will not require detailed analysis:

- **Agriculture and Forestry Resources**—Agricultural activities, such as livestock ranching (grazing) operation, are currently ongoing at the project site; however the site is not designated as important farmland under the California Farmland Mapping and Monitoring Program and the site is not subject to a Williamson Act contract. As such, the elimination of ranching and grazing from at least the Spotorno Flat as part of the Project is not expected to result in significant environmental effects.

- ***Geology, Soils and Seismicity—***While the Verona Fault runs through the eastern portion of the Project site and an Alquist-Priolo Fault Zone has been established around it, all development associated with the Project would be located in the Spotorno Flat area on the western portion of the site and outside of the Alquist-Priolo Fault Zone. Additionally, the Project would result in fewer housing units constructed on the site and fewer residents than anticipated in the HVSP EIR. As such, the Project would not result in new impacts related to geology, soils and seismicity over and above those previously analyzed in the HVSP EIR.
- ***Mineral Resources—***There are no known mineral resources located on or adjacent to the Project site and the nearest mineral resource recovery site is located approximately 3.5 miles to the southwest.
- ***Population and Housing—***The Project site is currently undeveloped and no housing units or residents would be displaced with Project implementation. Further, as noted above, the Project would result in a net reduction in the number of housing units and residents on the site as compared to what was previously envisioned in the HVSP and analyzed in the HVSP EIR. As such, the Project would not result in new impacts related to population and housing over and above those previously analyzed in the HVSP EIR.

## Public Meeting

The City of Pleasanton will conduct a scoping meeting on the Project in accordance with CEQA Section 21083.9. The scoping meeting is an opportunity for public agencies and interested members of the general public to learn about environmental review for the Project and to comment on environmental issues to be addressed in the Subsequent EIR.

**Date:** Wednesday April 26, 2017
**Time:** 7:00 p.m.
**Location:** 200 Old Bernal Avenue
Pleasanton CA 94566

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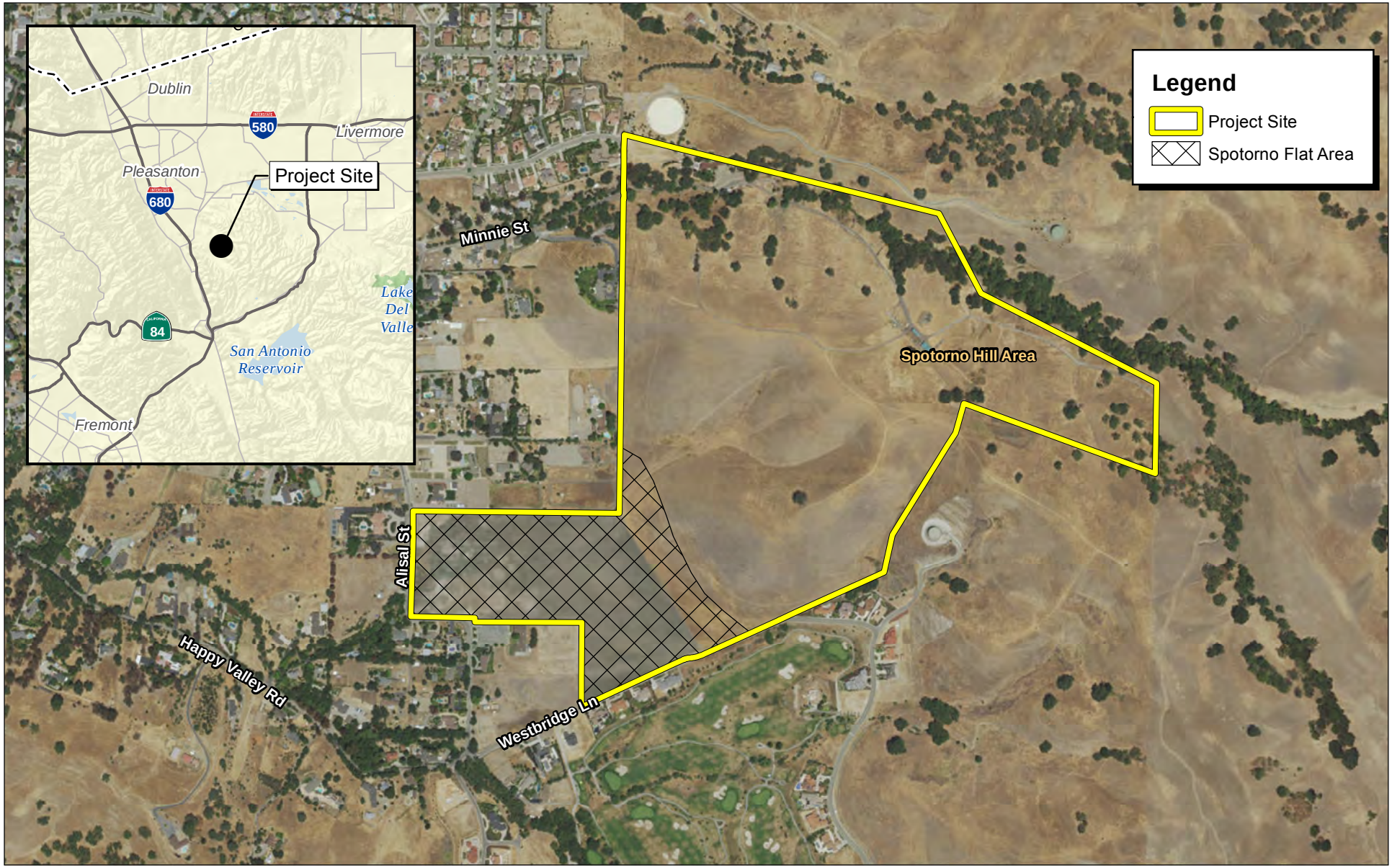


Source: ESRI Imagery, Ruggeri, Jensen, Azar, 2015

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Exhibit 1
Project Location

21480015 • 02/2017 | 1_location.mxd

CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

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Source: Ruggeri, Jensen, Azar, 2015

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# Exhibit 2
# Proposed Site Plan

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# A.2 - Responses

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ALAMEDA
County Transportation Commission
1111 Broadway, Suite 800, Oakland, CA 94607 • 510.208.7400 • www.AlamedaCTC.org

Wednesday, May 03, 2017

Jenny Soo
Associate Planner
City of Pleasanton
P.O. Box 520
Pleasanton, CA 94566

SUBJECT: Response to the Notice of Preparation (NOP) of a Subsequent Environmental Impact Report for the Spotorno Ranch Project

Dear Ms. Soo,

Thank you for the opportunity to comment on the Notice of Preparation (NOP) of a Subsequent Environmental Impact Report for the Spotorno Ranch Project. The project site is located in the southern portion of the City of Pleasanton and is bounded by Alisal Street to the west, Westbridge Lane to the south, and undeveloped hills to the east. The project will build 39 single-family homes across 31 acres and preserve 123 acres as open space.

We have reviewed the project and determined that it is exempt from review under the Congestion Management Program Land Use Analysis Program as it will not generate 100 p.m. peak hour trips in excess of trip generation from existing land use designations.

Thank you for the opportunity to respond to this NOP. Please contact me at (510) 208-7426 or Chris Van Alstyne, Assistant Transportation Planner, at (510) 208-7479 if you have any questions.

Sincerely,

Saravana Suthanthira
Principal Transportation Planner

cc: Chris Van Alstyne, Assistant Transportation Planner
file: R:\Planning_Policy_Public_Affairs\Planning\CMP\LUAP\2017\May

**From:** Jenny Soo <JSoo@cityofpleasantonca.gov>
**Sent:** Thursday, April 27, 2017 8:55 AM
**To:** Andrew Hill
**Cc:** Mary Bean
**Subject:** FW: Tim Lewis Community - Major concern for public safety on Sycamore Rd due to increase traffic!

**From:** Robin Boggs **Sent:** Wednesday, April 26, 2017 2:02 PM
**To:** Jenny Soo; Carmen Jung
**Subject:** Tim Lewis Community - Major concern for public safety on Sycamore Rd due to increase traffic!

Dear Pleasanton Planning Commission,

Regarding the proposed plan to direct the traffic down Sycamore Road vs Sycamore Creek Road regarding the Tim Lewis Community in Pleasanton ...is of major concern! For us homeowners living along Sycamore Road, we are already enduring an impacted and hazardous roadway that has numerous legal implications of concern due to the speeding cars traveling from Calippi golf course ... not to mention no sidewalks and very, if none, patrol checks by the Pleasanton Police Department!

The homeowners along Sycamore Road feel this will strongly lead to a class action suit due to the lack or none existence of legal and safety measures not in place or incorporated presently, nor protection for the community due to the already over-flow of traffic traveling to and from the Calippi Golf Course. We are families, children, seniors and individuals with special needs that walk along Sycamore Road, many times due to the detriment of our safety. No sidewalks and too much traffic that is not being monitored by the City of Pleasanton. My neighbor's special needs son can no longer walk safely on the road due to non-conforming traffic, they ignore pedestrians and drive up to 60 miles an hour, yes 60 miles an hour. Basically it is a road unmanaged by traffic partrol and we, the citizens and homeowners are left without any help or protection from the constant flow of speeders, many from Calippi golf course. Just yesterday one of the senior citizens walking down Sycamore had to move into a driveway for his safety as many of the golfers are speeding home and break the speed law, many cannot see you until they right at you. I have had that happen many times. We literally take our life into our hands to walk on our road and to add how many more cars to our traffic?. We were told the City of Pleasanton would build a bypass road if the citizens allowed the golf course ...how many years ago was that and how many housing developements does the City of Pleasanton still consider and propose to build in our area without any plan to develope another road for traffic vs using our old, unsafe, unpatrolled by police, Sycamore Road.

It is time for the bypass road to be built or stop considering Sycamore Road as the back up road for the addtionnal traffic! The homeowners are at risk, it will be the city of Plesanton to bear the burden of the hazards and unsafe situations that will take place with adding more traffic, inevitable a lawsuit. We invite each City Council member or Planning Commission personal to join us in our walk down our road. Monday morning when you meet the garbage truck stopping and speeding golf course players, so frightening. Or you have delivery trucks traveling up to 50 miles an hour to Calippi Golf course, to walk along Sycamore is taking your life in your hands literally. Every time you consider adding more traffic to our little country road I hope the city of Pleasanton is ready to absorb the potential risks of life and injuries that no doubt will take place with added traffic. I am shocked they would place themselves in such legal liability. We are a small country road busting with what is now legal concern for our homeowners who have every right to walk safely down our road. We feel no protection or concern from the City of Pleasanton and that is not right especially when we compare and

observe other communities and how the city has protected them.  Every person who lives and walks on Sycamore Road should be a concern for the city of Pleasanton at this point should you decide to allow more traffic flow on this very small, over used country road!

Please pass my email on to the Planning Commision,

Thank you,

Robin Boggs, homeowner on Sycamore Road

Click here to report this email as spam.

**From:** Jenny Soo <JSoo@cityofpleasantonca.gov>
**Sent:** Thursday, April 27, 2017 8:57 AM
**To:** Andrew Hill
**Cc:** Mary Bean
**Subject:** FW: Tim Lewis Communities

-----Original Message-----
From: Thomas Daggett Sent: Sunday, April 23, 2017 8:10 PM
To: Jenny Soo
Subject: Tim Lewis Communities

Hello Ms. Soo,
This is Tom and Barbara Daggett located at 6034 Alisal Street. We have a few questions.
1. How does this project affect the potential for the annexation of Alisal Road? (We're in favor and have city water and sewer).
2. Is the 'by pass' road a dead issue now? For the record we don't think it makes sense to carve up the hill side but on the other hand we're not thrilled with more traffic on Alisal either.
3. If the project is approved, will there be any improvements to Alisal Road?
4. Regarding traffic mitigation, the 'no left turn' on Alisal coming from the golf course makes no sense to us and is an accommodation to those living on Happy Valley Road. If indeed the Happy Valley Road neighbors are concerned about the safety on Happy Valley Rd, then the city should work with the county to construct safety barriers, much like Castlewood Road.
That road is certainly more dangerous than Happy Valley and we've heard of no traffic mishaps in that neighborhood. If traffic is allowed to turn left on Happy Valley Rd then the traffic on Alisal will be somewhat reduced. We already get many 'speeders' heading to the golf course and homes in that area.
5. After the completion of the project are there any more projects in the area under consideration?
6. What is the potential time frame for the start of construction? How long will it take to complete the project?

Thank you for the opportunity to voice our concerns.
Sincerely, Tom and Barbara Daggett.

Click
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to report this email as spam.

Dear Adam...thank you for taking the time to discuss the Happy Valley issue. I will not be able to attend the Wednesday meeting since I am on vacation.

I am a 40 year resident of Happy Valley Road. My family and I were blessed to experience what the rural life offered to those who are longtime residents of the area. The area is truly unique and gives Pleasanton an opportunity to offer a wide range of lifestyles to our Pleasanton residents.

Over the years there has been a steady encroachment of the Happy Valley area by development. Over the years we were told that the the development of the Callippe golf course would minimize the development of residential building with the associated increase in traffic. We were told that access to the golf course would be via a bypass road, thus keeping golf traffic off of Happy Valley Road. Unfortunately, traffic has increased. Happy Valley Road is a narrow county road, without adequate street lighting and no sidewalks.

The road has numerous blind curves, and a number of driveways that lead to the road, hidden by the curves. We were told that the topography of the road precludes the addition of sewer service to the residents of the road. It is my feeling that the well water and septic tanks satisfactorily serve our residents. A recent check of my well water did not disclose a bacteria problem. We recycle our grey water. Only my wife and I reside in our home and our concrete septic tank holds all of our waste water and hardly any waste water drains into our leach lines. If there is any development of the Sportono property, then a bypass road must be included, as promised, even if it is built on the flat land that is being considered for development. Also it would be appropriate to have all properties being developed in the flat area to enter and exit via the bypass road. As for any future plans for the City to annex the Happy Valley Area, I do not feel it would be financially feasible for Happy Valley Road be brought up to city standards.

Thank you for allowing the residents to express their thoughts on the future development of the area.....Dennis Glafkides, 737 Happy Valley Rd.

**From:** Carmen Jung **Sent:** Tuesday, April 25, 2017 10:49 AM
**To:** Jenny Soo
**Cc:** Robin Boggs; Jung, Carmen
**Subject:** Tim Lewis Communities

Jenny,

I want to reach out to you today regarding the proposal by Tim Lewis Communities to build 39 homes on the 154 acre Spotorno property at 1000 Minnie St. I am unable to attend the meeting on April 26th so I wanted to share my comments and concerns.

We live on Sycamore Road and we love our rural setting within city boundaries. Unfortunately, as a result of the previous developments in our area as well as the development of the Calippe Golf Course the quiet and peaceful beauty of our area has slowly disappeared. And now there is talk of more homes being built in and around the Happy Valley area, in addition to all of the other developments being proposed throughout our beautiful city of Pleasanton. There has to be an end to all of this urban sprawl/growth. The streets, schools, etc. of our community cannot handle the increase in the number of people and traffic. Congestion in our town is at an all-time high...just look at the congestion now happening on Valley Ave as result of the sports park and new homes in the area! Or the traffic on Sunol Blvd/First Street throughout all times of the day!

Regarding the Tim Lewis proposal, Sycamore Road is not equipped to handle an increase in traffic. We do not have sidewalks, and we cannot even walk in our neighborhood without the fear of someone hitting us. You should experience the number of cars driving down our road, as well a the number of cars speeding down our road. Many times the speed indicators are showing speeds above 40 miles per hour that is in a 25 mile per hour zone! There are kids riding bikes down our road, people walking pets, etc., and all of us having to be concerned with our safety.

In addition, Sycamore Creek Road, not Sycamore Road was developed with the understanding that more traffic will be routed down that road. And the people that bought homes on Sycamore Creek Road bought with the understanding that their road would be the access point to Calippe and any other proposed housing developments.

Something has to change...it is the city's priority to protect the interests and enjoyment of the city's current residents, not the interests of developers.

I appreciate you sharing these comments with all appropriate individuals, and thank you for your time in reviewing my concerns.

Best regards,

Carmen D Jung

**From:** Daniel Marks **Sent:** Sunday, February 26, 2017 9:23 AM
**To:** Jenny Soo
**Subject:** P15-0564 Tim Lewis communities

Good morning Ms. Soo,

I received the notice for the P15-0564, public hearing and I do have some comments

1st do I need to be present at the meeting to get a response to my questions? And will these questions be asked at the hearing?
If I do not need to be there I am fine with that but If I do in order to have my questions appropriately answered then,
If so how do I go about speaking at the meeting? Only if I have to

Questions to be considered and for the purpose directing those towards the comments noted on the notice as It is stated;
that an application will be for "General Plan Amendment" a "Happy Valley Specific Plan Amendment" and a "PUD rezoning"

1. Is this amendment proposal for the entire Happy Valley area Specific Boundary?

2. Will Alisal Street need to be widened for any cause or reason whatsoever? Now or in the future for this proposed change and development?

3. What is the smallest and the largest square foot lot size associated with the 39 single family for sale units?

4. What is the smallest and largest square footage of the homes proposed to be built amongst the 39 single family units?

I look forward to your response.

Thank you

Daniel L. Marks

**From:** Benjamin Maughan **Sent:** Monday, February 27, 2017 8:58 PM
**To:** Jenny Soo
**Cc:** Justin Cheng; Shweta Bonn; Adam Weinstein; Gerry Beaudin; Deb Maughan; Michaela Hertle; Ng, Eileen, BOS Dist 4
**Subject:** P15-0564 Application - Tim Lewis Communities, 1000 Minnie Street & AKA Spotorno Project, Happy Valley Bypass Road.

Hi Jenny - I hope all is well. I live at 2215 Westbridge Lane in Pleasanton, CA. My neighbor Justin Cheng alerted me to this application. Please note, I did not receive a notice in the mail and I watch for these yellow pieces of paper "like a hawk". I also requested previously to be notified of all changes and activity about this specific project as I am concerned that pre-approved community plans may be amended, which would change the feel of the community, impact my home's value, and most importantly put my young children at risk.

I have major concerns with previous versions of this application that I have seen.

#1 - The most recent plans that I saw did not include the bypass road that was planned/promised.

#2 - The number of homes proposed is materially more than the existing surrounding communities and contrary to current zoning.

#3 - Traffic will be substantially increased on both Happy Valley and Alisal.

#4 - (Personally) My lot was purchased under the assumption of an eventual cul-de-sac according to the applicable plans. I have 3 children under 8 and I wanted them to be 'safe' to ride their bicycles in a cul-de-sac, not on a substantial thoroughfare.

I have BCCed a number of home owners that will be impacted by this proposal.

I have also CCed Eileen Ng from Alameda County District 4 as a change to our city's plan would materially impact the 'No Left Turn' decision re-affirmed ~two years ago, warranting it to be readdressed.

Could you please share the latest proposal from Tim Lewis Communities, city planning's current sentiment on the proposal, rationale for any deviation from the community plan, and the appropriate actions we can all take to prevent any changes to that plan?

I believe that Tim Lewis Communities should conform to the existing planning rules and zoning requirements, just like we all did when we built our homes.

I appreciate your care in responding to this matter.

Thanks,
Benjamin Maughan
2215 Westbridge Lane

From: S McGinnis [ Sent: Monday, April 17, 2017 12:19 PM
To: Jenny Soo
Subject: Fwd: P15-0564 Tim Lewis Communities

The current development of Pleasanton has degraded the quality of life for the residents of Pleasanton. We respectfully request that the city of Pleasanton halt and table further action on the putative development P15-0564. We wish to object to the above captioned development based upon the following:

1. Insufficient notice to persons affected by the proposeddevelopment;
2. Insufficient time to review the staff report on the above caption proposed development;
3. The increased traffic caused by the proposed development;
4. Environmental impact of the traffic resulting from the proposed development;
5. Environmental impact caused by the alteration of the land and the construction proposed;
6. Environmental impact caused by habitation on the proposed area of development;
7. Danger to endangered and/or threatened species currently on the area of the proposed development;
8. Violation of hillside development restrictions enacted by the voters of Pleasanton;
9. Failure of due process in the approval procedures for developments pursuant to city ordinances and State of California law;
10. Failure to comply with Pleasanton City Council directives to limit the impact of future developments upon the citizens of Sycamore Heights and Bridal Creek at the approval of Lund Ranch II;
11. Insufficient mitigation of the burden of additional development upon the Pleasanton school system;
12. Insufficient mitigation of the burden of additional development upon traffic circulation on Sunol Boulevard;
13. Insufficient mitigation of the burden of additional development upon the supply of water to the residents of the city of Pleasanton;
14. Insufficient mitigation of the burden of additional development upon the sewer system of the city of Pleasanton;
15. Insufficient mitigation of egress of the potential citizens of the development and of the residents of the surrounding neighborhoods in the event of fire, earthquakes or other Acts of God;
16. Insufficient mitigation of the burden of additional development upon fire, ambulance and police services;
17. Insufficient mitigation of the burden of additional development upon the costs of planning and inspection services of the city of Pleasanton;
18. Insufficient mitigation of the burden of additional development upon the parks and recreation of the city of Pleasanton.

We ask that the above objections be entered into the record and preserved as grounds for judicial review should that become necessary.

Steven McGinnis

**From:** Steve Mix **Sent:** Monday, April 24, 2017 10:05 PM
**To:** Jenny Soo
**Cc:** **Subject:** Spotorno property P15-0564

Jenny Soo,

Questions and comments regarding the Tim Lewis /Spotorno plan.

**Comments**
1) The addition of 39 homes to the neighborhood does not conform to the Happy Valley Specific Plan and what is currently in the area. Most homes/ ranchettes are a minimum of 2 acres. This proposal certainly looks like urban sprawl.

2) The Red Winged Blackbirds nest in the proposed development field every spring. Where will they go?

3)The bypass road was to be included if the area was to be developed.

**Questions:**
1) Where will storm water go? Will Tim Lewis or the city upgrade the current drainage along Alisal street? Currently it flows down the side or middle of the street and erodes the sides of the road. Adding a great deal more impervious surface to the 30 acre field will only increase run off. Alisal does not have any storm drains, it flows to the creek that runs down Happy Valley road. This year the road flooded 2 times and had to be closed. In one of the incidents, people had to be rescued by emergency personnel.

Will the water from the development be diverted to the creek on Happy Valley? Or added to the sewer system and diverted to the Pleasanton water treatment area (zone 7).

If diverted there WILL BE less recharging of ground water that occurs on the 30 acre flat area.

2) Will all of the traffic from the proposed development and Westbridge be diverted down Alisal street? Or will the "No left turn " sign be removed so traffic can go down Happy Valley road. Alisal street as it stands today cannot handle additional traffic without jeopardizing the hundreds of walkers, runners, and cyclists.

3) What will be done about the additional traffic at the intersection of Sycamore Creek Way and Sycamore Road. Currently only Sycamore Road has a stop sign.

4) When we purchased our property and built our home 3 1/2 years ago we were not allowed to have a second structure (in law home). Now Tim Lewis plan #3 allows for a 512 sq ft Casita, which could be rented /occupied, which could make the 39 homes plus 39 casitas total 78 homes. This must be included in the EIRs.

5) When we built our home, we were NOT allowed to have our garage doors facing the street. They had to be on the side of our home. The proposed development includes said garage doors facing the street.

How many Homes and Casitas can be built in the Tim Lewis Plan?  How does this "fit" into the neighborhood???

In closing, we are NOT against development or new housing. We ARE against urban sprawl and a development that does NOT match the existing character of the area. Small ranchettes of 1-2 acres per parcel would be satisfactory and we believe, well received by residents.

I look forward to hearing answers to the questions.

Steve and Darlene Mix

STATE OF CALIFORNIA
NATIVE AMERICAN HERITAGE COMMISSION
**Environmental and Cultural Department**
**1550 Harbor Blvd., Suite 100**
**West Sacramento, CA 95691**
**Phone (916) 373-3710**
**Fax (916) 373-5471**
**Email: nahc@nahc.ca.gov**
**Website: http://www.nahc.ca.gov**
**Twitter: @CA_NAHC**

Edmund G. Brown Jr., Governor

RECEIVED
MAY 10 2017
CITY OF PLEASANTON
PLANNING DIVISION

May 4, 2017

Jenny Soo
City of Pleasanton
200 Old Bernal Avenue
Pleasanton, CA 94552

RE: SCH#2017042032 Spotorno Ranch Project, Alameda County

Dear Ms. Soo:

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

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

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

AB 52

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

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

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

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

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

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

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

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

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

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

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

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

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

SB 18

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

Some of SB 18's provisions include:

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

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

NAHC Recommendations for Cultural Resources Assessments

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

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

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

b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

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

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

If you have any questions, please contact me at my email address: frank.lienert@nahc.ca.gov

Sincerely,

Frank Lienert
Associate Governmental Program Analyst

cc: State Clearinghouse

**From:** YanHang Guan **Sent:** Sunday, March 05, 2017 12:09 AM
**To:** Jenny Soo; Rong Wang
**Subject:** Regarding P15-0564 Tim Lewis Communities

Hi Jenny,

This is Rong Wang. Property owner of 2295 Westbridge Lane. We received PI15-O564 Tim Lewis Communities public hearing notice. From the notice, it does not include the bypass road that was planned/promised. I am concerned about traffic will be substantially increased on Westbridge, Happy Valley and Alisal. It is already busy at day time due to traffic to/from the public golf course. Also I would like to get clarification on whether the zoning of the proposed community is the same as the immediate surrounding neighborhood and conform to the existing planning rules and zoning requirements.

Appreciate your attention to this matter.

Best regards,
Rong Wang
2295 Westbridge Lane

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MAY 08 2017

CITY OF PLEASANTON
PLANNING DIVISION

May 5, 2017

Dear City of Pleasanton Planning Commissioners Herb Ritter, Nancy Allen, David Nagler - Vice-Chair, Justin Brown - Alternate,

We are writing to you today to comment on the scoping for the EIR for our property and also to express our extreme dissatisfaction with the Planning Commission's position with respect to the proposed development of our property. Since the adoption of the Happy Valley Specific Plan, we have made several efforts to exercise our rights to develop our property in accordance with the Specific Plan. In every instance, we have faced opposition not just from neighbors, but from the City as well. We have been contacted by people who have lived here 20-30-40 or more years and are outraged that after all these years, we still have not been allowed to move forward. Even though the number of units we are proposing has decreased from 97 to 39, we are now being told by the Planning Commission that we can build no more than 22 units. Frankly, that position is nothing less than insulting, especially in light of our family's history in this City. (See attached East Bay News Article.)

As outlined in more detail below, we are very disappointed with the Planning Commission's position for the following reasons: First, the Commission fails to take into consideration our long history of great faith and cooperation with the City. We believe that situations like this should result in mutually satisfactory outcomes. They should not go all in favor of the City or the latest local opinion; Next, the proposed development comports with your own planning guidance; and finally, we are very concerned about the Trail placement. As proposed, it presents an attractive nuisance and safety and security concerns for our ranching operations.

Our family heritage ranch, a legacy property, was established in Pleasanton in 1867 by my Great-Uncle Jean Baptiste Spotorno and his Brother, my Grandfather, Gaston Pierre Spotorno. Both men were very involved in helping to build Pleasanton, such as supplying lumber and materials for the elementary school, graveling Main St. on a routine basis as well as the old St. Augustine Church parking area on Rose Ave. My Grandfather, Gaston, helped to form the Pleasanton Township Water District to protect the water rights of the farmers and ranchers from being taken away by the Spring Valley Water Company of San Francisco, who wanted control of Pleasanton's aquifers. My Father, Alexandre Victor Spotorno and his Brother, Emile Spotorno, took over the ranch business in the early 1920s. At that time the Happy Valley area was landlocked, so in 1927 Alameda County approached the Spotorno Family and other neighbors to deed part of their lands for a road. The Family agreed and deeded Alameda County a portion of the ranch for the building of Alisal St. Therefore, Alisal St. is **our** street as much as it is for others in the area. In 1938 Emile and my Father split the ranch, with Emile taking ownership of the portion he later sold to the Lund Family, and my Father keeping the portion I still own today with my family. I took over the operation in 1949 after returning from World War II and graduating from U.C. Davis. Our Family participated in the development of the Happy Valley Specific Plan and of the Pleasanton General Plan and served on the Blue Ribbon Committee. In the year 2000 when the City was ready to start building the Callippe Golf Course, they came to us and explained they needed a

Spotorno Land & Livestock • P.O. BOX 487 • Pleasanton • California • 94566

portion of our land to complete Westbridge Lane and provide for water and sewer connections for the golf course, as well as renting out our Flat for staging their equipment during construction. We complied. Over the years the Spotorno Family has continued to cooperate and to be involved in Pleasanton civic affairs. Every year we donate prizes to the 4-H and FFA Champion and Reserve Champion Sheep winners at the Alameda County Fair. We are members of the Amador-Livermore Valley Historical Society and the Museum On Main. We have participated in Pleasanton's Heritage Days at their request. We are members of the Catholic Community of Pleasanton, contributing to their various building funds over the years, as well as supporting projects for people in need. We served on the very first Board of Directors of the Senior Support Program of the Tri-Valley for ten years. And... this year we mark the 150th anniversary of the founding of Spotorno Ranch, of which we are very proud.

The Ranch consists of three parcels: The 3.5 acre House parcel, the 44 acre Minnie Road parcel which encompasses our ranching operations area, and the 111+/- acres which includes the flat and upper hills for a total of approximately 158+/- acres. We were very surprised when we received the meeting notice stating the proposed development was on 154 acres. The 3.5 acre House parcel and the 44 acre Minnie Road parcel are separate and will remain in private ownership. To clarify, <u>the 111+/- acres is the only parcel we are selling</u> to Tim Lewis Communities. This parcel includes the housing development and a significant conservation area, which we intend to hold under our management to continue ranching operations as recommended by the **2005-2025 Pleasanton General Plan. On page 12-8 under Agriculture** is this statement: **"Although no longer the most important activity in Pleasanton, agriculture still contributes to the rural flavor around and within parts of the city.... The Vineyard Avenue Corridor and Happy Valley (South Pleasanton) areas contain many ranchettes with livestock."** In addition the **Happy Valley Specific Plan** clearly states on **page 28 item 4 a. " The purpose of the PUD-SRDR District is to guide future development in such a way as to maintain the semi-rural character of the Greater Happy Valley. The ranchette lotting pattern, ranch style architecture, informal landscaping, varieties of open fencing, and the keeping of farm animals are all components of the character which the Specific Plan seeks to perpetuate."** Continuing ranching operations and running cattle on the conservation easement fulfills that mandate.

Times have changed since the 1998 Specific Plan. Our developers are proposing a project in the least environmentally disruptive location on the ranch It is an infill project utilizing existing roads, water and sewer infrastructure. This project would not affect the views of the southeast hills nor require removal of sensitive habitat. There will not be significant increases to local traffic patterns and in terms of overall density it is considerably smaller than the specific plan allocation for the Spotorno ranch or any of the past proposals from other developers. The proposed density, lot sizes and architectural character are consistent with newer homes that are our neighbors, built on Sycamore Creek Way, Sycamore, Alisal, Westbridge, Serenity and the proposed homes on Lund Ranch.

In regards to open space land that the City already controls we find them to be very poor and unresponsive neighbors with little consideration for proper range management, invasive weed and rodent control, fence and water system maintenance, fire protection and erosion control. Based on this history we find the desire to create even more city owned public open space in South Pleasanton to be questionable. On the other hand ranching operations on the remaining open space is in line with the General Plan, contributes a rural view shed and provides solutions to the extensive and expensive maintenance required on such a large parcel.

We also have concerns regarding trail placement. There are many trail opportunities that exist to connect the proposed development with the currently underutilized and poorly maintained golf course open space which would avoid the remaining private property and other sensitive areas of the ranching operations. One option would be to run a connection around the base of the hill back to the water tank where there is a trail into the city controlled open space. In addition, a combined walking trail and bike path along Westbridge Lane is a much needed amenity in the existing community.

We believe that a trail following the amended bypass road route in order to connect with Lund open space is not practical. This trail alignment would require a very steep and southern treeless exposure, cross an existing cattle crossing, require an expensive bridge to crossover our private driveway and creek crossing and would need to get by the city's own water tank. An eastern connection from the golf course to Lund, although away from the private house parcels and sheds, would also require navigating steep terrain and a very deep creek crossing, and be difficult to police in such a remote location. This would create a great liability for our farming operation as an attractive nuisance enticing people to go into the sensitive creek or encroach on our equipment, barns, corrals, farm vehicles, tool and work sheds. We refuse to be responsible for such liabilities. We know from our own experience that people on trails, out of curiosity, ignorance, or just plain malice, do not stay on the trails in this area. Permit me to give you a few examples of the trespassing we've endured.

We've had bikers climb over our fences and ride all over our land all the way down to our house area, as well as hikers who "got lost", couldn't find their way back to the trail and ended up at our house. Some of these bicyclists have met us at our front gate as we're returning to our ranch from church or errands, and have become belligerent with us when we've asked what they're doing on our property. Three years ago when we went into the haybarn to feed our cattle, we found dozens of burnt matches strewn all over the barn floor. The storage and tool boxes had been ransacked. How that hay didn't burst into flames is a miracle, because not only the barns would have burned and the hay destroyed costing tens of thousands of dollars, the fire would have continued to burn all the way down to Alisal St. and beyond taking everything in its path. And... just last October 2016 the old farmhouse that my Grandfather built on what later became the Lund Ranch property, burned down as a result of teenagers partying at night in the old abandoned house. What's to stop them from doing this on our private property?

The Minnie Road parcel is our only vehicle access/egress to and from our ranch and for our operations. Putting a trail there will be dangerous for those walking that trail, as

well as for vehicle drivers, including farm vehicles, hay delivery trucks and livestock transport trucks. Our work and tool sheds are there as well as our farm trucks, which will be "attractive nuisances" to hikers and bikers. I don't think our insurance company would approve of such a liability. When Brian Swift was Planning Director in the 1990s and early 2000s, he attempted to put Minnie Road as a possible trail in the Specific Plan. We explained our position, requested that he remove Minnie Road from the list of possible trails, and he did. How did this trail come up for discussion once again?

We have a right to our privacy and to protecting the safety of our home, ranching operations and our personal safety. Having people traipse all over our private property undermines our safety and peace of mind, and we will not tolerate it. **Thirty-nine homes do not justify the taking of our property and the destruction of the peaceful pursuit of our livelihood and our lives. Page 2-9 of the 2005-2025 Pleasanton General Plan clearly states, "Attempts to achieve public access to open-space areas and trails should not create onerous impositions on property owners."**

We realize this is just the beginning of the development process and we are more than willing to work with Planning to come up with viable options that benefit the community and at the same time protect our rights to privacy and safety. We need to clarify what is reasonable, responsible, safe and fair for our family as we proceed. We wish to extend an invitation to each one of you to our ranch for a tour of these two parcels so you may see for yourself what we are trying to preserve, and then discuss the possibilities of trails with fencing that may serve your purpose and ours.

I hope we've demonstrated that we're not just some rambunctious developer coming in to "rape the land" for a profit. We chose Tim Lewis Communities because we trust them to understand what our goals and the City's goals are to complete a project that will meet our needs and benefit all. We are a Family, who for 150 years have loved, worked hard for and helped this little Pleasanton Township grow into the beautiful City and community we know and value today.

Thank you for your time and consideration.

Sincerely,

Alex V. Spotorno & Family

cc: Jerry Thorne, Mayor
Adam Weinstein, Planning Manager
Daniel G. Sodergren, City Attorney
Larissa Seto, Assistant City Attorney

Attachment: May 4, 2017 East Bay News Article P. 7 by Dan Walters

# Why California's housing problem is getting worse

By Dan Walters

Capitol politicians — most of them, anyway — are celebrating a multibillion-dollar package of new taxes and fees to shore up the state's dilapidated transportation network.

Meanwhile, however, they take a lackadaisical attitude on a crisis that's infinitely more serious than rough roads and congestion — an ever-worsening shortage of housing. And some "solutions" would make it even more intractable.

Soaring housing costs are distressing millions of Californians, forcing them to devote 50 percent or more of their incomes to shelter. It hits the working poor particularly hard, gives us the nation's highest poverty rate and threatens the economy.

The breadth of the housing gap is shown in a couple of dry statistical reports that Brown's Department of Finance issued on Monday. One charts California population growth since 2010, and the other shows that housing supply grew only half as much.

California has seen a relatively modest population growth, 2.3 million or 6 percent, since 2010, but has added just 400,000 housing units, a 2.9 percent increase.

The state housing department calculates that we need to add 180,000 new units a year to keep pace with population and replace units lost to fire and demolition. We're barely building 100,000 new units a year now, and the net is only half of what we need.

In other words, the gap is getting wider every minute. Why? The virtually unanimous conclusion of housing experts is that the reluctance of local governments, particularly cities, to approve new housing projects due to backlash from self-proclaimed environmentalists and not-in-my-backyard activists is a major factor.

FREDERIC J. BROWN/AFP/GETTY IMAGES

An open house sign on a California corner is a sight rarer than it should be, given the acute shortage of housing here.

The new housing data seem to support that contention.

Los Angeles saw its population grow by 6.5 percent in 2010-17, but its housing stock increased just 4 percent.

Other cities' gaps were as bad or worse. San Diego: 8 percent population growth, 3.9 percent housing growth. San Francisco: population up 8.6 percent, housing up 5.9 percent. San Jose: 10.7 percent more people, just 5.7 percent more housing. Sacramento: population up 5.7, housing up 1.1 percent.

Nevertheless, Democrats who dominate the Capitol, from Gov. Jerry Brown down, have proposed — but not enacted — only tepid, marginal approaches that would do little to close the gap.

Brown proposed a very mild reform, forcing cities to accept projects that are transit-oriented and/or meant for the poor. But he hasn't pushed very hard and faces opposition from environmentalists and labor unions who don't want to cut red tape that housing opponents use to thwart projects.

Quite a few other housing bills are floating around the Capitol, including one that would tax real estate transactions to underwrite low-income housing. But none would have a big impact, and some would actually discourage construction, such as allowing cities to enact tighter rent controls or mandating higher-priced union labor on projects.

It seems that those in the Capitol want credit for trying to alleviate the housing crisis rather than actually doing something to solve it.

*Dan Walters is a Sacramento Bee columnist.*

# Appendix B: Spotorno Ranch Project CalEEMod Output, Construction Health Risk Assessment Calculations, and AERMOD Modeling Output

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# Spotorno Ranch Project CalEEMod Output, Construction Health Risk Assessment Calculations, and AERMOD Modeling Output

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# 2148.0015 Spotorno Ranch - Unmitigated Construction

**Alameda County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard

Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite

Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 0.1644 | 1.8370 | 1.0454 | 1.8500e-003 | 0.3359 | 0.0858 | 0.4218 | 0.1768 | 0.0790 | 0.2558 | 0.0000 | 168.7705 | 168.7705 | 0.0510 | 0.0000 | 170.0448 |
| 2019 | 0.3616 | 3.2464 | 2.6287 | 5.3200e-003 | 0.1014 | 0.1719 | 0.2733 | 0.0275 | 0.1616 | 0.1892 | 0.0000 | 475.1323 | 475.1323 | 0.0828 | 0.0000 | 477.2014 |
| 2020 | 1.3069 | 2.2945 | 2.0395 | 4.0900e-003 | 0.0733 | 0.1163 | 0.1896 | 0.0199 | 0.1092 | 0.1291 | 0.0000 | 362.1720 | 362.1720 | 0.0671 | 0.0000 | 363.8487 |
| **Maximum** | **1.3069** | **3.2464** | **2.6287** | **5.3200e-003** | **0.3359** | **0.1719** | **0.4218** | **0.1768** | **0.1616** | **0.2558** | **0.0000** | **475.1323** | **475.1323** | **0.0828** | **0.0000** | **477.2014** |

### 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 | 0.1644 | 1.8370 | 1.0454 | 1.8500e-003 | 0.1541 | 0.0858 | 0.2400 | 0.0803 | 0.0790 | 0.1593 | 0.0000 | 168.7703 | 168.7703 | 0.0510 | 0.0000 | 170.0446 |
| 2019 | 0.3616 | 3.2464 | 2.6287 | 5.3200e-003 | 0.1014 | 0.1719 | 0.2733 | 0.0275 | 0.1616 | 0.1892 | 0.0000 | 475.1320 | 475.1320 | 0.0828 | 0.0000 | 477.2011 |
| 2020 | 1.3069 | 2.2945 | 2.0395 | 4.0900e-003 | 0.0733 | 0.1163 | 0.1896 | 0.0199 | 0.1092 | 0.1291 | 0.0000 | 362.1717 | 362.1717 | 0.0671 | 0.0000 | 363.8484 |
| **Maximum** | **1.3069** | **3.2464** | **2.6287** | **5.3200e-003** | **0.1541** | **0.1719** | **0.2733** | **0.0803** | **0.1616** | **0.1892** | **0.0000** | **475.1320** | **475.1320** | **0.0828** | **0.0000** | **477.2011** |

| | **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** | **35.61** | **0.00** | **20.55** | **43.02** | **0.00** | **16.80** | **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** | **10-10-2018** | **1-9-2019** | 1.9005 | 1.9005 |
| **2** | **1-10-2019** | **4-9-2019** | 0.8900 | 0.8900 |
| **3** | **4-10-2019** | **7-9-2019** | 0.8967 | 0.8967 |
| **4** | **7-10-2019** | **10-9-2019** | 0.9069 | 0.9069 |
| **5** | **10-10-2019** | **1-9-2020** | 0.9020 | 0.9020 |
| **6** | **1-10-2020** | **4-9-2020** | 0.8186 | 0.8186 |
| **7** | **4-10-2020** | **7-9-2020** | 0.8159 | 0.8159 |
| **8** | **7-10-2020** | **9-30-2020** | 0.6579 | 0.6579 |
| | | **Highest** | 1.9005 | 1.9005 |

## 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 | 0.6997 | 5.9000e-003 | 0.3825 | 3.2000e-004 | | 0.0166 | 0.0166 | | 0.0166 | 0.0166 | 1.9986 | 1.6903 | 3.6889 | 9.8300e-003 | 2.0000e-005 | 3.9412 |
| Energy | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 130.8564 | 130.8564 | 4.3100e-003 | 1.8200e-003 | 131.5078 |
| Mobile | 0.1185 | 0.7626 | 1.3008 | 4.3900e-003 | 0.3242 | 5.3300e-003 | 0.3295 | 0.0872 | 5.0200e-003 | 0.0922 | 0.0000 | 404.4965 | 404.4965 | 0.0185 | 0.0000 | 404.9601 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 9.5487 | 0.0000 | 9.5487 | 0.5643 | 0.0000 | 23.6565 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.8061 | 4.3166 | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |
| **Total** | **0.8243** | **0.8208** | **1.7056** | **5.0400e-003** | **0.3242** | **0.0262** | **0.3504** | **0.0872** | **0.0259** | **0.1130** | **12.3534** | **541.3598** | **553.7132** | **0.6800** | **3.8400e-003** | **571.8588** |

### 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 | 0.6895 | 4.3900e-003 | 0.2889 | 2.0000e-005 | | 1.6700e-003 | 1.6700e-003 | | 1.6700e-003 | 1.6700e-003 | 0.0000 | 1.6860 | 1.6860 | 4.8000e-004 | 2.0000e-005 | 1.7046 |
| Energy | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 130.8564 | 130.8564 | 4.3100e-003 | 1.8200e-003 | 131.5078 |
| Mobile | 0.1176 | 0.7547 | 1.2823 | 4.3100e-003 | 0.3177 | 5.2300e-003 | 0.3229 | 0.0854 | 4.9300e-003 | 0.0904 | 0.0000 | 397.2021 | 397.2021 | 0.0183 | 0.0000 | 397.6604 |
| Waste | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 9.5487 | 0.0000 | 9.5487 | 0.5643 | 0.0000 | 23.6565 |
| Water | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.8061 | 4.3166 | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |
| **Total** | **0.8133** | **0.8113** | **1.5935** | **4.6600e-003** | **0.3177** | **0.0111** | **0.3288** | **0.0854** | **0.0108** | **0.0962** | **10.3548** | **534.0610** | **544.4159** | **0.6704** | **3.8400e-003** | **562.3225** |

| | **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** | **1.34** | **1.16** | **6.57** | **7.54** | **2.00** | **57.49** | **6.14** | **2.00** | **58.14** | **14.84** | **16.18** | **1.35** | **1.68** | **1.41** | **0.00** | **1.67** |

## 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area:**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 0.1807 | 0.0000 | 0.1807 | 0.0993 | 0.0000 | 0.0993 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0456 | 0.4820 | 0.2248 | 3.8000e-004 | | 0.0258 | 0.0258 | | 0.0237 | 0.0237 | 0.0000 | 34.7599 | 34.7599 | 0.0108 | 0.0000 | 35.0304 |
| **Total** | **0.0456** | **0.4820** | **0.2248** | **3.8000e-004** | **0.1807** | **0.0258** | **0.2064** | **0.0993** | **0.0237** | **0.1230** | **0.0000** | **34.7599** | **34.7599** | **0.0108** | **0.0000** | **35.0304** |

## 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 | 7.5000e-004 | 5.9000e-004 | 5.9100e-003 | 1.0000e-005 | 1.4200e-003 | 1.0000e-005 | 1.4300e-003 | 3.8000e-004 | 1.0000e-005 | 3.9000e-004 | 0.0000 | 1.3449 | 1.3449 | 4.0000e-005 | 0.0000 | 1.3459 |
| **Total** | **7.5000e-004** | **5.9000e-004** | **5.9100e-003** | **1.0000e-005** | **1.4200e-003** | **1.0000e-005** | **1.4300e-003** | **3.8000e-004** | **1.0000e-005** | **3.9000e-004** | **0.0000** | **1.3449** | **1.3449** | **4.0000e-005** | **0.0000** | **1.3459** |

## 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 | | | | | 0.0813 | 0.0000 | 0.0813 | 0.0447 | 0.0000 | 0.0447 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0456 | 0.4820 | 0.2248 | 3.8000e-004 | | 0.0258 | 0.0258 | | 0.0237 | 0.0237 | 0.0000 | 34.7599 | 34.7599 | 0.0108 | 0.0000 | 35.0304 |
| **Total** | **0.0456** | **0.4820** | **0.2248** | **3.8000e-004** | **0.0813** | **0.0258** | **0.1071** | **0.0447** | **0.0237** | **0.0684** | **0.0000** | **34.7599** | **34.7599** | **0.0108** | **0.0000** | **35.0304** |

## 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 | 7.5000e-004 | 5.9000e-004 | 5.9100e-003 | 1.0000e-005 | 1.4200e-003 | 1.0000e-005 | 1.4300e-003 | 3.8000e-004 | 1.0000e-005 | 3.9000e-004 | 0.0000 | 1.3449 | 1.3449 | 4.0000e-005 | 0.0000 | 1.3459 |
| **Total** | **7.5000e-004** | **5.9000e-004** | **5.9100e-003** | **1.0000e-005** | **1.4200e-003** | **1.0000e-005** | **1.4300e-003** | **3.8000e-004** | **1.0000e-005** | **3.9000e-004** | **0.0000** | **1.3449** | **1.3449** | **4.0000e-005** | **0.0000** | **1.3459** |

## 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 | | | | | 0.1499 | 0.0000 | 0.1499 | 0.0760 | 0.0000 | 0.0760 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1145 | 1.3392 | 0.7895 | 1.4000e-003 | | 0.0593 | 0.0593 | | 0.0545 | 0.0545 | 0.0000 | 127.4591 | 127.4591 | 0.0397 | 0.0000 | 128.4511 |
| **Total** | **0.1145** | **1.3392** | **0.7895** | **1.4000e-003** | **0.1499** | **0.0593** | **0.2092** | **0.0760** | **0.0545** | **0.1306** | **0.0000** | **127.4591** | **127.4591** | **0.0397** | **0.0000** | **128.4511** |

### 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 | 1.8900e-003 | 1.4800e-003 | 0.0148 | 4.0000e-005 | 3.5600e-003 | 3.0000e-005 | 3.5800e-003 | 9.5000e-004 | 2.0000e-005 | 9.7000e-004 | 0.0000 | 3.3621 | 3.3621 | 1.1000e-004 | 0.0000 | 3.3648 |
| **Total** | **1.8900e-003** | **1.4800e-003** | **0.0148** | **4.0000e-005** | **3.5600e-003** | **3.0000e-005** | **3.5800e-003** | **9.5000e-004** | **2.0000e-005** | **9.7000e-004** | **0.0000** | **3.3621** | **3.3621** | **1.1000e-004** | **0.0000** | **3.3648** |

### 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 | | | | | 0.0675 | 0.0000 | 0.0675 | 0.0342 | 0.0000 | 0.0342 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1145 | 1.3392 | 0.7895 | 1.4000e-003 | | 0.0593 | 0.0593 | | 0.0545 | 0.0545 | 0.0000 | 127.4590 | 127.4590 | 0.0397 | 0.0000 | 128.4510 |
| **Total** | **0.1145** | **1.3392** | **0.7895** | **1.4000e-003** | **0.0675** | **0.0593** | **0.1267** | **0.0342** | **0.0545** | **0.0887** | **0.0000** | **127.4590** | **127.4590** | **0.0397** | **0.0000** | **128.4510** |

## 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 | 1.8900e-003 | 1.4800e-003 | 0.0148 | 4.0000e-005 | 3.5600e-003 | 3.0000e-005 | 3.5800e-003 | 9.5000e-004 | 2.0000e-005 | 9.7000e-004 | 0.0000 | 3.3621 | 3.3621 | 1.1000e-004 | 0.0000 | 3.3648 |
| **Total** | **1.8900e-003** | **1.4800e-003** | **0.0148** | **4.0000e-005** | **3.5600e-003** | **3.0000e-005** | **3.5800e-003** | **9.5000e-004** | **2.0000e-005** | **9.7000e-004** | **0.0000** | **3.3621** | **3.3621** | **1.1000e-004** | **0.0000** | **3.3648** |

## 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 | 1.3400e-003 | 0.0117 | 8.7900e-003 | 1.0000e-005 | | 7.5000e-004 | 7.5000e-004 | | 7.0000e-004 | 7.0000e-004 | 0.0000 | 1.1888 | 1.1888 | 2.9000e-004 | 0.0000 | 1.1961 |
| **Total** | **1.3400e-003** | **0.0117** | **8.7900e-003** | **1.0000e-005** | | **7.5000e-004** | **7.5000e-004** | | **7.0000e-004** | **7.0000e-004** | **0.0000** | **1.1888** | **1.1888** | **2.9000e-004** | **0.0000** | **1.1961** |

## 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 | 7.0000e-005 | 1.8900e-003 | 4.3000e-004 | 0.0000 | 9.0000e-005 | 1.0000e-005 | 1.1000e-004 | 3.0000e-005 | 1.0000e-005 | 4.0000e-005 | 0.0000 | 0.3755 | 0.3755 | 2.0000e-005 | 0.0000 | 0.3761 |
| Worker | 1.6000e-004 | 1.2000e-004 | 1.2300e-003 | 0.0000 | 3.0000e-004 | 0.0000 | 3.0000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2802 | 0.2802 | 1.0000e-005 | 0.0000 | 0.2804 |
| **Total** | **2.3000e-004** | **2.0100e-003** | **1.6600e-003** | **0.0000** | **3.9000e-004** | **1.0000e-005** | **4.1000e-004** | **1.1000e-004** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **0.6557** | **0.6557** | **3.0000e-005** | **0.0000** | **0.6565** |

## 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 | 1.3400e-003 | 0.0117 | 8.7900e-003 | 1.0000e-005 | | 7.5000e-004 | 7.5000e-004 | | 7.0000e-004 | 7.0000e-004 | 0.0000 | 1.1888 | 1.1888 | 2.9000e-004 | 0.0000 | 1.1961 |
| **Total** | **1.3400e-003** | **0.0117** | **8.7900e-003** | **1.0000e-005** | | **7.5000e-004** | **7.5000e-004** | | **7.0000e-004** | **7.0000e-004** | **0.0000** | **1.1888** | **1.1888** | **2.9000e-004** | **0.0000** | **1.1961** |

## 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 | 7.0000e-005 | 1.8900e-003 | 4.3000e-004 | 0.0000 | 9.0000e-005 | 1.0000e-005 | 1.1000e-004 | 3.0000e-005 | 1.0000e-005 | 4.0000e-005 | 0.0000 | 0.3755 | 0.3755 | 2.0000e-005 | 0.0000 | 0.3761 |
| Worker | 1.6000e-004 | 1.2000e-004 | 1.2300e-003 | 0.0000 | 3.0000e-004 | 0.0000 | 3.0000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2802 | 0.2802 | 1.0000e-005 | 0.0000 | 0.2804 |
| **Total** | **2.3000e-004** | **2.0100e-003** | **1.6600e-003** | **0.0000** | **3.9000e-004** | **1.0000e-005** | **4.1000e-004** | **1.1000e-004** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **0.6557** | **0.6557** | **3.0000e-005** | **0.0000** | **0.6565** |

# 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 | 0.3081 | 2.7508 | 2.2399 | 3.5100e-003 | | 0.1683 | 0.1683 | | 0.1583 | 0.1583 | 0.0000 | 306.8110 | 306.8110 | 0.0747 | 0.0000 | 308.6795 |
| **Total** | **0.3081** | **2.7508** | **2.2399** | **3.5100e-003** | | **0.1683** | **0.1683** | | **0.1583** | **0.1583** | **0.0000** | **306.8110** | **306.8110** | **0.0747** | **0.0000** | **308.6795** |

## 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 | 0.0165 | 0.4673 | 0.1034 | 1.0200e-003 | 0.0240 | 2.9900e-003 | 0.0270 | 6.9400e-003 | 2.8600e-003 | 9.8000e-003 | 0.0000 | 97.3334 | 97.3334 | 6.0000e-003 | 0.0000 | 97.4833 |
| Worker | 0.0371 | 0.0283 | 0.2854 | 7.9000e-004 | 0.0774 | 5.5000e-004 | 0.0779 | 0.0206 | 5.1000e-004 | 0.0211 | 0.0000 | 70.9880 | 70.9880 | 2.0200e-003 | 0.0000 | 71.0386 |
| **Total** | **0.0535** | **0.4956** | **0.3888** | **1.8100e-003** | **0.1014** | **3.5400e-003** | **0.1049** | **0.0275** | **3.3700e-003** | **0.0309** | **0.0000** | **168.3214** | **168.3214** | **8.0200e-003** | **0.0000** | **168.5219** |

## 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 | 0.3081 | 2.7508 | 2.2399 | 3.5100e-003 | | 0.1683 | 0.1683 | | 0.1583 | 0.1583 | 0.0000 | 306.8106 | 306.8106 | 0.0747 | 0.0000 | 308.6792 |
| **Total** | **0.3081** | **2.7508** | **2.2399** | **3.5100e-003** | | **0.1683** | **0.1683** | | **0.1583** | **0.1583** | **0.0000** | **306.8106** | **306.8106** | **0.0747** | **0.0000** | **308.6792** |

## 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 | 0.0165 | 0.4673 | 0.1034 | 1.0200e-003 | 0.0240 | 2.9900e-003 | 0.0270 | 6.9400e-003 | 2.8600e-003 | 9.8000e-003 | 0.0000 | 97.3334 | 97.3334 | 6.0000e-003 | 0.0000 | 97.4833 |
| Worker | 0.0371 | 0.0283 | 0.2854 | 7.9000e-004 | 0.0774 | 5.5000e-004 | 0.0779 | 0.0206 | 5.1000e-004 | 0.0211 | 0.0000 | 70.9880 | 70.9880 | 2.0200e-003 | 0.0000 | 71.0386 |
| **Total** | **0.0535** | **0.4956** | **0.3888** | **1.8100e-003** | **0.1014** | **3.5400e-003** | **0.1049** | **0.0275** | **3.3700e-003** | **0.0309** | **0.0000** | **168.3214** | **168.3214** | **8.0200e-003** | **0.0000** | **168.5219** |

## 3.4 Building Construction - 2020

### 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 | 0.1887 | 1.7076 | 1.4995 | 2.4000e-003 | | 0.0994 | 0.0994 | | 0.0935 | 0.0935 | 0.0000 | 206.1329 | 206.1329 | 0.0503 | 0.0000 | 207.3901 |
| **Total** | **0.1887** | **1.7076** | **1.4995** | **2.4000e-003** | | **0.0994** | **0.0994** | | **0.0935** | **0.0935** | **0.0000** | **206.1329** | **206.1329** | **0.0503** | **0.0000** | **207.3901** |

### 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 | 9.3600e-003 | 0.2929 | 0.0631 | 6.9000e-004 | 0.0164 | 1.3600e-003 | 0.0177 | 4.7300e-003 | 1.3000e-003 | 6.0300e-003 | 0.0000 | 65.9160 | 65.9160 | 3.7900e-003 | 0.0000 | 66.0107 |
| Worker | 0.0231 | 0.0170 | 0.1747 | 5.2000e-004 | 0.0528 | 3.7000e-004 | 0.0531 | 0.0140 | 3.4000e-004 | 0.0144 | 0.0000 | 46.9156 | 46.9156 | 1.2100e-003 | 0.0000 | 46.9459 |
| **Total** | **0.0324** | **0.3100** | **0.2378** | **1.2100e-003** | **0.0692** | **1.7300e-003** | **0.0709** | **0.0188** | **1.6400e-003** | **0.0204** | **0.0000** | **112.8316** | **112.8316** | **5.0000e-003** | **0.0000** | **112.9566** |

### 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 | 0.1887 | 1.7076 | 1.4995 | 2.4000e-003 | | 0.0994 | 0.0994 | | 0.0935 | 0.0935 | 0.0000 | 206.1326 | 206.1326 | 0.0503 | 0.0000 | 207.3899 |
| **Total** | **0.1887** | **1.7076** | **1.4995** | **2.4000e-003** | | **0.0994** | **0.0994** | | **0.0935** | **0.0935** | **0.0000** | **206.1326** | **206.1326** | **0.0503** | **0.0000** | **207.3899** |

## 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 | 9.3600e-003 | 0.2929 | 0.0631 | 6.9000e-004 | 0.0164 | 1.3600e-003 | 0.0177 | 4.7300e-003 | 1.3000e-003 | 6.0300e-003 | 0.0000 | 65.9160 | 65.9160 | 3.7900e-003 | 0.0000 | 66.0107 |
| Worker | 0.0231 | 0.0170 | 0.1747 | 5.2000e-004 | 0.0528 | 3.7000e-004 | 0.0531 | 0.0140 | 3.4000e-004 | 0.0144 | 0.0000 | 46.9156 | 46.9156 | 1.2100e-003 | 0.0000 | 46.9459 |
| **Total** | **0.0324** | **0.3100** | **0.2378** | **1.2100e-003** | **0.0692** | **1.7300e-003** | **0.0709** | **0.0188** | **1.6400e-003** | **0.0204** | **0.0000** | **112.8316** | **112.8316** | **5.0000e-003** | **0.0000** | **112.9566** |

# 3.5 Paving - 2020

## 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 | 0.0237 | 0.2462 | 0.2564 | 4.0000e-004 | | 0.0132 | 0.0132 | | 0.0121 | 0.0121 | 0.0000 | 35.0494 | 35.0494 | 0.0113 | 0.0000 | 35.3328 |
| Paving | 5.1900e-003 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0289** | **0.2462** | **0.2564** | **4.0000e-004** | | **0.0132** | **0.0132** | | **0.0121** | **0.0121** | **0.0000** | **35.0494** | **35.0494** | **0.0113** | **0.0000** | **35.3328** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

## 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 | 0.0237 | 0.2462 | 0.2564 | 4.0000e-004 | | 0.0132 | 0.0132 | | 0.0121 | 0.0121 | 0.0000 | 35.0493 | 35.0493 | 0.0113 | 0.0000 | 35.3327 |
| Paving | 5.1900e-003 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0289** | **0.2462** | **0.2564** | **4.0000e-004** | | **0.0132** | **0.0132** | | **0.0121** | **0.0121** | **0.0000** | **35.0493** | **35.0493** | **0.0113** | **0.0000** | **35.3327** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

# 3.6 Architectural Coating - 2020

## 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 | 1.0508 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 4.2400e-003 | 0.0295 | 0.0321 | 5.0000e-005 | | 1.9400e-003 | 1.9400e-003 | | 1.9400e-003 | 1.9400e-003 | 0.0000 | 4.4682 | 4.4682 | 3.5000e-004 | 0.0000 | 4.4768 |
| **Total** | **1.0550** | **0.0295** | **0.0321** | **5.0000e-005** | | **1.9400e-003** | **1.9400e-003** | | **1.9400e-003** | **1.9400e-003** | **0.0000** | **4.4682** | **4.4682** | **3.5000e-004** | **0.0000** | **4.4768** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

## 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 | 1.0508 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 4.2400e-003 | 0.0295 | 0.0321 | 5.0000e-005 | | 1.9400e-003 | 1.9400e-003 | | 1.9400e-003 | 1.9400e-003 | 0.0000 | 4.4682 | 4.4682 | 3.5000e-004 | 0.0000 | 4.4768 |
| **Total** | **1.0550** | **0.0295** | **0.0321** | **5.0000e-005** | | **1.9400e-003** | **1.9400e-003** | | **1.9400e-003** | **1.9400e-003** | **0.0000** | **4.4682** | **4.4682** | **3.5000e-004** | **0.0000** | **4.4768** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

Improve Pedestrian Network

| | 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 | 0.1176 | 0.7547 | 1.2823 | 4.3100e-003 | 0.3177 | 5.2300e-003 | 0.3229 | 0.0854 | 4.9300e-003 | 0.0904 | 0.0000 | 397.2021 | 397.2021 | 0.0183 | 0.0000 | 397.6604 |
| Unmitigated | 0.1185 | 0.7626 | 1.3008 | 4.3900e-003 | 0.3242 | 5.3300e-003 | 0.3295 | 0.0872 | 5.0200e-003 | 0.0922 | 0.0000 | 404.4965 | 404.4965 | 0.0185 | 0.0000 | 404.9601 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | | |
| Single Family Housing | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |
| Total | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |

## 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 |
| Other Asphalt Surfaces | 9.50 | 7.30 | 7.30 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Single Family Housing | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |
| Single Family Housing | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | 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 | 70.3664 | 70.3664 | 3.1500e-003 | 7.2000e-004 | 70.6584 |
| Electricity Unmitigated | | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 70.3664 | 70.3664 | 3.1500e-003 | 7.2000e-004 | 70.6584 |
| NaturalGas Mitigated | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 60.4899 | 60.4899 | 1.1600e-003 | 1.1100e-003 | 60.8494 |
| NaturalGas Unmitigated | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 60.4899 | 60.4899 | 1.1600e-003 | 1.1100e-003 | 60.8494 |

### 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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 1.13354e+006 | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 60.4899 | 60.4899 | 1.1600e-003 | 1.1100e-003 | 60.8494 |
| **Total** | | **6.1100e-003** | **0.0522** | **0.0222** | **3.3000e-004** | | **4.2200e-003** | **4.2200e-003** | | **4.2200e-003** | **4.2200e-003** | **0.0000** | **60.4899** | **60.4899** | **1.1600e-003** | **1.1100e-003** | **60.8494** |

**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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 1.13354e+006 | 6.1100e-003 | 0.0522 | 0.0222 | 3.3000e-004 | | 4.2200e-003 | 4.2200e-003 | | 4.2200e-003 | 4.2200e-003 | 0.0000 | 60.4899 | 60.4899 | 1.1600e-003 | 1.1100e-003 | 60.8494 |
| **Total** | | **6.1100e-003** | **0.0522** | **0.0222** | **3.3000e-004** | | **4.2200e-003** | **4.2200e-003** | | **4.2200e-003** | **4.2200e-003** | **0.0000** | **60.4899** | **60.4899** | **1.1600e-003** | **1.1100e-003** | **60.8494** |

## 5.3 Energy by Land Use - Electricity

### Unmitigated

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Other Asphalt Surfaces | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 315532 | 70.3664 | 3.1500e-003 | 7.2000e-004 | 70.6584 |
| **Total** | | **70.3664** | **3.1500e-003** | **7.2000e-004** | **70.6584** |

### Mitigated

| | Electricity Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | kWh/yr | MT/yr | | | |
| Other Asphalt Surfaces | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 315532 | 70.3664 | 3.1500e-003 | 7.2000e-004 | 70.6584 |
| **Total** | | **70.3664** | **3.1500e-003** | **7.2000e-004** | **70.6584** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use only Natural Gas Hearths

| | 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 | 0.6895 | 4.3900e-003 | 0.2889 | 2.0000e-005 | | 1.6700e-003 | 1.6700e-003 | | 1.6700e-003 | 1.6700e-003 | 0.0000 | 1.6860 | 1.6860 | 4.8000e-004 | 2.0000e-005 | 1.7046 |
| Unmitigated | 0.6997 | 5.9000e-003 | 0.3825 | 3.2000e-004 | | 0.0166 | 0.0166 | | 0.0166 | 0.0166 | 1.9986 | 1.6903 | 3.6889 | 9.8300e-003 | 2.0000e-005 | 3.9412 |

## 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 | 0.1051 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.5756 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 0.0102 | 2.5400e-003 | 0.0919 | 3.1000e-004 | | 0.0150 | 0.0150 | | 0.0150 | 0.0150 | 1.9986 | 1.2172 | 3.2158 | 9.3700e-003 | 2.0000e-005 | 3.4566 |
| Landscaping | 8.8500e-003 | 3.3600e-003 | 0.2906 | 2.0000e-005 | | 1.6000e-003 | 1.6000e-003 | | 1.6000e-003 | 1.6000e-003 | 0.0000 | 0.4731 | 0.4731 | 4.6000e-004 | 0.0000 | 0.4846 |
| **Total** | **0.6998** | **5.9000e-003** | **0.3825** | **3.3000e-004** | | **0.0166** | **0.0166** | | **0.0166** | **0.0166** | **1.9986** | **1.6903** | **3.6889** | **9.8300e-003** | **2.0000e-005** | **3.9412** |

**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 | 0.1051 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Consumer Products | 0.5756 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Hearth | 1.2000e-004 | 1.0500e-003 | 4.5000e-004 | 1.0000e-005 | | 8.0000e-005 | 8.0000e-005 | | 8.0000e-005 | 8.0000e-005 | 0.0000 | 1.2172 | 1.2172 | 2.0000e-005 | 2.0000e-005 | 1.2244 |
| Landscaping | 8.7200e-003 | 3.3400e-003 | 0.2885 | 2.0000e-005 | | 1.5900e-003 | 1.5900e-003 | | 1.5900e-003 | 1.5900e-003 | 0.0000 | 0.4688 | 0.4688 | 4.5000e-004 | 0.0000 | 0.4802 |
| **Total** | **0.6895** | **4.3900e-003** | **0.2889** | **3.0000e-005** | | **1.6700e-003** | **1.6700e-003** | | **1.6700e-003** | **1.6700e-003** | **0.0000** | **1.6860** | **1.6860** | **4.7000e-004** | **2.0000e-005** | **1.7046** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| Category | MT/yr | | | |
| Mitigated | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |
| Unmitigated | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |

## 7.2 Water by Land Use

**Unmitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Other Asphalt Surfaces | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 2.54101 / 1.60194 | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |
| **Total** | | **5.1227** | **0.0830** | **2.0000e-003** | **7.7932** |

**Mitigated**

| | Indoor/Outdoor Use | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | Mgal | MT/yr | | | |
| Other Asphalt Surfaces | 0 / 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 2.54101 / 1.60194 | 5.1227 | 0.0830 | 2.0000e-003 | 7.7932 |
| **Total** | | **5.1227** | **0.0830** | **2.0000e-003** | **7.7932** |

# 8.0 Waste Detail

## 8.1 Mitigation Measures Waste

**Category/Year**

| | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|
| | MT/yr | | | |
| Mitigated | 9.5487 | 0.5643 | 0.0000 | 23.6565 |
| Unmitigated | 9.5487 | 0.5643 | 0.0000 | 23.6565 |

## 8.2 Waste by Land Use

**Unmitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Other Asphalt Surfaces | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 47.04 | 9.5487 | 0.5643 | 0.0000 | 23.6565 |
| **Total** | | **9.5487** | **0.5643** | **0.0000** | **23.6565** |

**Mitigated**

| | Waste Disposed | Total CO2 | CH4 | N2O | CO2e |
|---|---|---|---|---|---|
| Land Use | tons | MT/yr | | | |
| Other Asphalt Surfaces | 0 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Single Family Housing | 47.04 | 9.5487 | 0.5643 | 0.0000 | 23.6565 |
| **Total** | | **9.5487** | **0.5643** | **0.0000** | **23.6565** |

## 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

# 2148.0015 Spotorno Ranch - Unmitigated Construction

**Alameda County, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard
Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite

Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 5.1786 | 59.5798 | 35.8006 | 0.0638 | 18.2141 | 2.6349 | 20.7921 | 9.9699 | 2.4241 | 12.3416 | 0.0000 | 6,422.0032 | 6,422.0032 | 1.9495 | 0.0000 | 6,470.7400 |
| 2019 | 2.7851 | 24.8052 | 20.2806 | 0.0413 | 0.8058 | 1.3168 | 2.1227 | 0.2180 | 1.2384 | 1.4564 | 0.0000 | 4,069.7149 | 4,069.7149 | 0.6981 | 0.0000 | 4,087.1663 |
| 2020 | 60.3420 | 22.6088 | 19.6488 | 0.0410 | 0.8058 | 1.1363 | 1.9422 | 0.2181 | 1.0686 | 1.2867 | 0.0000 | 4,005.5245 | 4,005.5245 | 0.7172 | 0.0000 | 4,022.6206 |
| **Maximum** | **60.3420** | **59.5798** | **35.8006** | **0.0638** | **18.2141** | **2.6349** | **20.7921** | **9.9699** | **2.4241** | **12.3416** | **0.0000** | **6,422.0032** | **6,422.0032** | **1.9495** | **0.0000** | **6,470.7400** |

## 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 | 5.1786 | 59.5798 | 35.8006 | 0.0638 | 8.2777 | 2.6349 | 10.8556 | 4.5080 | 2.4241 | 6.8798 | 0.0000 | 6,422.0032 | 6,422.0032 | 1.9495 | 0.0000 | 6,470.7400 |
| 2019 | 2.7851 | 24.8052 | 20.2806 | 0.0413 | 0.8058 | 1.3168 | 2.1227 | 0.2180 | 1.2384 | 1.4564 | 0.0000 | 4,069.7149 | 4,069.7149 | 0.6981 | 0.0000 | 4,087.1663 |
| 2020 | 60.3420 | 22.6088 | 19.6488 | 0.0410 | 0.8058 | 1.1363 | 1.9422 | 0.2181 | 1.0686 | 1.2867 | 0.0000 | 4,005.5245 | 4,005.5245 | 0.7172 | 0.0000 | 4,022.6206 |
| **Maximum** | **60.3420** | **59.5798** | **35.8006** | **0.0638** | **8.2777** | **2.6349** | **10.8556** | **4.5080** | **2.4241** | **6.8798** | **0.0000** | **6,422.0032** | **6,422.0032** | **1.9495** | **0.0000** | **6,470.7400** |

| | **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** | **50.12** | **0.00** | **39.97** | **52.49** | **0.00** | **36.21** | **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 | 4.8071 | 0.3678 | 11.9980 | 0.0297 | | 1.4505 | 1.4505 | | 1.4505 | 1.4505 | 209.2203 | 246.6766 | 455.8969 | 0.9883 | 4.4200e-003 | 481.9212 |
| Energy | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| Mobile | 0.7785 | 4.2755 | 7.7085 | 0.0267 | 1.9371 | 0.0306 | 1.9677 | 0.5191 | 0.0289 | 0.5479 | | 2,710.6015 | 2,710.6015 | 0.1170 | | 2,713.5261 |
| **Total** | **5.6191** | **4.9294** | **19.8283** | **0.0583** | **1.9371** | **1.5042** | **3.4413** | **0.5191** | **1.5025** | **2.0216** | **209.2203** | **3,322.6411** | **3,531.8614** | **1.1123** | **0.0111** | **3,562.9813** |

## 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 | 3.8489 | 0.2258 | 3.2856 | 1.3700e-003 | | 0.0329 | 0.0329 | | 0.0329 | 0.0329 | 0.0000 | 246.6244 | 246.6244 | 0.0102 | 4.4200e-003 | 248.1951 |
| Energy | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| Mobile | 0.7735 | 4.2319 | 7.5884 | 0.0263 | 1.8984 | 0.0300 | 1.9284 | 0.5087 | 0.0283 | 0.5370 | | 2,661.6683 | 2,661.6683 | 0.1156 | | 2,664.5578 |
| **Total** | **4.6559** | **4.7439** | **10.9958** | **0.0295** | **1.8984** | **0.0860** | **1.9844** | **0.5087** | **0.0843** | **0.5930** | **0.0000** | **3,273.6557** | **3,273.6557** | **0.1328** | **0.0111** | **3,280.2870** |

| | **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** | **17.14** | **3.76** | **44.55** | **49.47** | **2.00** | **94.28** | **42.34** | **2.00** | **94.39** | **70.66** | **100.00** | **1.47** | **7.31** | **88.06** | **0.00** | **7.93** |

# 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking**

## OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 18.0663 | 0.0000 | 18.0663 | 9.9307 | 0.0000 | 9.9307 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **18.0663** | **2.5769** | **20.6432** | **9.9307** | **2.3708** | **12.3014** | | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

### 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 | 0.0796 | 0.0522 | 0.6401 | 1.6100e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 159.8173 | 159.8173 | 4.9500e-003 | | 159.9410 |
| **Total** | **0.0796** | **0.0522** | **0.6401** | **1.6100e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **159.8173** | **159.8173** | **4.9500e-003** | | **159.9410** |

### 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 | | | | | 8.1298 | 0.0000 | 8.1298 | 4.4688 | 0.0000 | 4.4688 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | 0.0000 | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **8.1298** | **2.5769** | **10.7067** | **4.4688** | **2.3708** | **6.8396** | **0.0000** | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

## 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 | 0.0796 | 0.0522 | 0.6401 | 1.6100e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 159.8173 | 159.8173 | 4.9500e-003 | | 159.9410 |
| **Total** | **0.0796** | **0.0522** | **0.6401** | **1.6100e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **159.8173** | **159.8173** | **4.9500e-003** | | **159.9410** |

# 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 | | | | | 6.6622 | 0.0000 | 6.6622 | 3.3793 | 0.0000 | 3.3793 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **6.6622** | **2.6337** | **9.2959** | **3.3793** | **2.4230** | **5.8024** | | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0885 | 0.0580 | 0.7112 | 1.7800e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 177.5748 | 177.5748 | 5.5000e-003 | | 177.7122 |
| **Total** | **0.0885** | **0.0580** | **0.7112** | **1.7800e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **177.5748** | **177.5748** | **5.5000e-003** | | **177.7122** |

## 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 | | | | | 2.9980 | 0.0000 | 2.9980 | 1.5207 | 0.0000 | 1.5207 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | 0.0000 | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **2.9980** | **2.6337** | **5.6317** | **1.5207** | **2.4230** | **3.9437** | **0.0000** | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0885 | 0.0580 | 0.7112 | 1.7800e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 177.5748 | 177.5748 | 5.5000e-003 | | 177.7122 |
| **Total** | **0.0885** | **0.0580** | **0.7112** | **1.7800e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **177.5748** | **177.5748** | **5.5000e-003** | | **177.7122** |

# 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

## 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 | 0.1366 | 3.7236 | 0.8057 | 7.9400e-003 | 0.1897 | 0.0268 | 0.2165 | 0.0546 | 0.0256 | 0.0802 | | 837.2392 | 837.2392 | 0.0507 | | 838.5063 |
| Worker | 0.3318 | 0.2176 | 2.6669 | 6.6900e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 665.9054 | 665.9054 | 0.0206 | | 666.4207 |
| **Total** | **0.4684** | **3.9412** | **3.4725** | **0.0146** | **0.8058** | **0.0311** | **0.8369** | **0.2180** | **0.0296** | **0.2477** | | **1,503.1447** | **1,503.1447** | **0.0713** | | **1,504.9270** |

## 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | 0.0000 | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | **0.0000** | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

## 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 | 0.1366 | 3.7236 | 0.8057 | 7.9400e-003 | 0.1897 | 0.0268 | 0.2165 | 0.0546 | 0.0256 | 0.0802 | | 837.2392 | 837.2392 | 0.0507 | | 838.5063 |
| Worker | 0.3318 | 0.2176 | 2.6669 | 6.6900e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 665.9054 | 665.9054 | 0.0206 | | 666.4207 |
| **Total** | **0.4684** | **3.9412** | **3.4725** | **0.0146** | **0.8058** | **0.0311** | **0.8369** | **0.2180** | **0.0296** | **0.2477** | | **1,503.1447** | **1,503.1447** | **0.0713** | | **1,504.9270** |

## 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

### 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 | 0.1238 | 3.5354 | 0.7394 | 7.8900e-003 | 0.1897 | 0.0227 | 0.2125 | 0.0546 | 0.0218 | 0.0764 | | 831.6429 | 831.6429 | 0.0485 | | 832.8550 |
| Worker | 0.3001 | 0.1910 | 2.3775 | 6.4900e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 646.4918 | 646.4918 | 0.0182 | | 646.9479 |
| **Total** | **0.4240** | **3.7264** | **3.1168** | **0.0144** | **0.8058** | **0.0270** | **0.8328** | **0.2180** | **0.0257** | **0.2437** | | **1,478.1347** | **1,478.1347** | **0.0667** | | **1,479.8029** |

### 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | 0.0000 | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | **0.0000** | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1238 | 3.5354 | 0.7394 | 7.8900e-003 | 0.1897 | 0.0227 | 0.2125 | 0.0546 | 0.0218 | 0.0764 | | 831.6429 | 831.6429 | 0.0485 | | 832.8550 |
| Worker | 0.3001 | 0.1910 | 2.3775 | 6.4900e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 646.4918 | 646.4918 | 0.0182 | | 646.9479 |
| **Total** | **0.4240** | **3.7264** | **3.1168** | **0.0144** | **0.8058** | **0.0270** | **0.8328** | **0.2180** | **0.0257** | **0.2437** | | **1,478.1347** | **1,478.1347** | **0.0667** | | **1,479.8029** |

## 3.4 Building Construction - 2020

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1030 | 3.2539 | 0.6608 | 7.8300e-003 | 0.1897 | 0.0152 | 0.2049 | 0.0546 | 0.0145 | 0.0691 | | 825.9402 | 825.9402 | 0.0449 | | 827.0635 |
| Worker | 0.2744 | 0.1689 | 2.1395 | 6.2900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 626.5213 | 626.5213 | 0.0161 | | 626.9227 |
| **Total** | **0.3774** | **3.4228** | **2.8003** | **0.0141** | **0.8058** | **0.0193** | **0.8251** | **0.2181** | **0.0183** | **0.2363** | | **1,452.4615** | **1,452.4615** | **0.0610** | | **1,453.9862** |

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | 0.0000 | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | **0.0000** | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1030 | 3.2539 | 0.6608 | 7.8300e-003 | 0.1897 | 0.0152 | 0.2049 | 0.0546 | 0.0145 | 0.0691 | | 825.9402 | 825.9402 | 0.0449 | | 827.0635 |
| Worker | 0.2744 | 0.1689 | 2.1395 | 6.2900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 626.5213 | 626.5213 | 0.0161 | | 626.9227 |
| **Total** | **0.3774** | **3.4228** | **2.8003** | **0.0141** | **0.8058** | **0.0193** | **0.8251** | **0.2181** | **0.0183** | **0.2363** | | **1,452.4615** | **1,452.4615** | **0.0610** | | **1,453.9862** |

# 3.5 Paving - 2020

## 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

## 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

## 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | 0.0000 | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | **0.0000** | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

## 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

## 3.6 Architectural Coating - 2020

### 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

### 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

### 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

**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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

Improve Pedestrian Network

| | 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 | 0.7735 | 4.2319 | 7.5884 | 0.0263 | 1.8984 | 0.0300 | 1.9284 | 0.5087 | 0.0283 | 0.5370 | | 2,661.6683 | 2,661.6683 | 0.1156 | | 2,664.5578 |
| Unmitigated | 0.7785 | 4.2755 | 7.7085 | 0.0267 | 1.9371 | 0.0306 | 1.9677 | 0.5191 | 0.0289 | 0.5479 | | 2,710.6015 | 2,710.6015 | 0.1170 | | 2,713.5261 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | | |
| Single Family Housing | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |
| Total | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |

## 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- | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Other Asphalt Surfaces | 9.50 | 7.30 | 7.30 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Single Family Housing | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |
| Single Family Housing | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | 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 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| NaturalGas Unmitigated | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |

### 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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3105.58 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

**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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3.10558 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use only Natural Gas Hearths

| | 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 | 3.8489 | 0.2258 | 3.2856 | 1.3700e-003 | | 0.0329 | 0.0329 | | 0.0329 | 0.0329 | 0.0000 | 246.6244 | 246.6244 | 0.0102 | 4.4200e-003 | 248.1951 |
| Unmitigated | 4.8071 | 0.3678 | 11.9980 | 0.0297 | | 1.4505 | 1.4505 | | 1.4505 | 1.4505 | 209.2203 | 246.6766 | 455.8969 | 0.9883 | 4.4200e-003 | 481.9212 |

## 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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.9789 | 0.3304 | 8.7695 | 0.0296 | | 1.4327 | 1.4327 | | 1.4327 | 1.4327 | 209.2203 | 240.8824 | 450.1026 | 0.9827 | 4.4200e-003 | 475.9856 |
| Landscaping | 0.0983 | 0.0373 | 3.2286 | 1.7000e-004 | | 0.0178 | 0.0178 | | 0.0178 | 0.0178 | | 5.7943 | 5.7943 | 5.6500e-003 | | 5.9356 |
| **Total** | **4.8071** | **0.3678** | **11.9981** | **0.0297** | | **1.4505** | **1.4505** | | **1.4505** | **1.4505** | **209.2203** | **246.6766** | **455.8969** | **0.9883** | **4.4200e-003** | **481.9212** |

**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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.0221 | 0.1887 | 0.0803 | 1.2000e-003 | | 0.0153 | 0.0153 | | 0.0153 | 0.0153 | 0.0000 | 240.8824 | 240.8824 | 4.6200e-003 | 4.4200e-003 | 242.3138 |
| Landscaping | 0.0969 | 0.0371 | 3.2053 | 1.7000e-004 | | 0.0176 | 0.0176 | | 0.0176 | 0.0176 | | 5.7421 | 5.7421 | 5.5700e-003 | | 5.8813 |
| **Total** | **3.8489** | **0.2258** | **3.2856** | **1.3700e-003** | | **0.0329** | **0.0329** | | **0.0329** | **0.0329** | **0.0000** | **246.6244** | **246.6244** | **0.0102** | **4.4200e-003** | **248.1951** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

## 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

# 2148.0015 Spotorno Ranch - Unmitigated Construction

**Alameda County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard

Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite

Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 5.1827 | 59.5940 | 35.7680 | 0.0637 | 18.2141 | 2.6349 | 20.7921 | 9.9699 | 2.4241 | 12.3416 | 0.0000 | 6,407.8589 | 6,407.8589 | 1.9492 | 0.0000 | 6,456.5884 |
| 2019 | 2.8042 | 24.8939 | 20.2728 | 0.0406 | 0.8058 | 1.3172 | 2.1230 | 0.2180 | 1.2387 | 1.4567 | 0.0000 | 3,995.5893 | 3,995.5893 | 0.7020 | 0.0000 | 4,013.1387 |
| 2020 | 60.3444 | 22.6818 | 19.6337 | 0.0403 | 0.8058 | 1.1366 | 1.9424 | 0.2181 | 1.0689 | 1.2869 | 0.0000 | 3,932.8379 | 3,932.8379 | 0.7170 | 0.0000 | 3,950.0236 |
| **Maximum** | **60.3444** | **59.5940** | **35.7680** | **0.0637** | **18.2141** | **2.6349** | **20.7921** | **9.9699** | **2.4241** | **12.3416** | **0.0000** | **6,407.8589** | **6,407.8589** | **1.9492** | **0.0000** | **6,456.5884** |

### 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 | 5.1827 | 59.5940 | 35.7680 | 0.0637 | 8.2777 | 2.6349 | 10.8556 | 4.5080 | 2.4241 | 6.8798 | 0.0000 | 6,407.8589 | 6,407.8589 | 1.9492 | 0.0000 | 6,456.5884 |
| 2019 | 2.8042 | 24.8939 | 20.2728 | 0.0406 | 0.8058 | 1.3172 | 2.1230 | 0.2180 | 1.2387 | 1.4567 | 0.0000 | 3,995.5893 | 3,995.5893 | 0.7020 | 0.0000 | 4,013.1387 |
| 2020 | 60.3444 | 22.6818 | 19.6337 | 0.0403 | 0.8058 | 1.1366 | 1.9424 | 0.2181 | 1.0689 | 1.2869 | 0.0000 | 3,932.8379 | 3,932.8379 | 0.7170 | 0.0000 | 3,950.0236 |
| **Maximum** | **60.3444** | **59.5940** | **35.7680** | **0.0637** | **8.2777** | **2.6349** | **10.8556** | **4.5080** | **2.4241** | **6.8798** | **0.0000** | **6,407.8589** | **6,407.8589** | **1.9492** | **0.0000** | **6,456.5884** |

| | **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** | **50.12** | **0.00** | **39.97** | **52.49** | **0.00** | **36.21** | **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 | 4.8071 | 0.3678 | 11.9980 | 0.0297 | | 1.4505 | 1.4505 | | 1.4505 | 1.4505 | 209.2203 | 246.6766 | 455.8969 | 0.9883 | 4.4200e-003 | 481.9212 |
| Energy | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| Mobile | 0.6782 | 4.4475 | 7.8951 | 0.0251 | 1.9371 | 0.0308 | 1.9679 | 0.5191 | 0.0291 | 0.5482 | | 2,540.7413 | 2,540.7413 | 0.1220 | | 2,543.7912 |
| **Total** | **5.5188** | **5.1015** | **20.0150** | **0.0566** | **1.9371** | **1.5045** | **3.4416** | **0.5191** | **1.5027** | **2.0218** | **209.2203** | **3,152.7809** | **3,362.0011** | **1.1173** | **0.0111** | **3,393.2465** |

### 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 | 3.8489 | 0.2258 | 3.2856 | 1.3700e-003 | | 0.0329 | 0.0329 | | 0.0329 | 0.0329 | 0.0000 | 246.6244 | 246.6244 | 0.0102 | 4.4200e-003 | 248.1951 |
| Energy | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| Mobile | 0.6732 | 4.3999 | 7.7877 | 0.0246 | 1.8984 | 0.0303 | 1.9286 | 0.5087 | 0.0286 | 0.5373 | | 2,494.6671 | 2,494.6671 | 0.1207 | | 2,497.6837 |
| **Total** | **4.5556** | **4.9119** | **11.1951** | **0.0278** | **1.8984** | **0.0863** | **1.9846** | **0.5087** | **0.0846** | **0.5933** | **0.0000** | **3,106.6544** | **3,106.6544** | **0.1379** | **0.0111** | **3,113.4129** |

| | 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** | **17.45** | **3.72** | **44.07** | **50.88** | **2.00** | **94.26** | **42.33** | **2.00** | **94.37** | **70.66** | **100.00** | **1.46** | **7.60** | **87.66** | **0.00** | **8.25** |

## 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 18.0663 | 0.0000 | 18.0663 | 9.9307 | 0.0000 | 9.9307 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **18.0663** | **2.5769** | **20.6432** | **9.9307** | **2.3708** | **12.3014** | | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

**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 | 0.0833 | 0.0650 | 0.6107 | 1.4800e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 147.0874 | 147.0874 | 4.6800e-003 | | 147.2045 |
| **Total** | **0.0833** | **0.0650** | **0.6107** | **1.4800e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **147.0874** | **147.0874** | **4.6800e-003** | | **147.2045** |

## 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 | | | | | 8.1298 | 0.0000 | 8.1298 | 4.4688 | 0.0000 | 4.4688 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | 0.0000 | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **8.1298** | **2.5769** | **10.7067** | **4.4688** | **2.3708** | **6.8396** | **0.0000** | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

## 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 | 0.0833 | 0.0650 | 0.6107 | 1.4800e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 147.0874 | 147.0874 | 4.6800e-003 | | 147.2045 |
| **Total** | **0.0833** | **0.0650** | **0.6107** | **1.4800e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **147.0874** | **147.0874** | **4.6800e-003** | | **147.2045** |

# 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 | | | | | 6.6622 | 0.0000 | 6.6622 | 3.3793 | 0.0000 | 3.3793 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **6.6622** | **2.6337** | **9.2959** | **3.3793** | **2.4230** | **5.8024** | | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0926 | 0.0722 | 0.6786 | 1.6400e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 163.4305 | 163.4305 | 5.2000e-003 | | 163.5606 |
| **Total** | **0.0926** | **0.0722** | **0.6786** | **1.6400e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **163.4305** | **163.4305** | **5.2000e-003** | | **163.5606** |

## 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 | | | | | 2.9980 | 0.0000 | 2.9980 | 1.5207 | 0.0000 | 1.5207 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | 0.0000 | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **2.9980** | **2.6337** | **5.6317** | **1.5207** | **2.4230** | **3.9437** | **0.0000** | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0926 | 0.0722 | 0.6786 | 1.6400e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 163.4305 | 163.4305 | 5.2000e-003 | | 163.5606 |
| **Total** | **0.0926** | **0.0722** | **0.6786** | **1.6400e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **163.4305** | **163.4305** | **5.2000e-003** | | **163.5606** |

## 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

### 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 | 0.1430 | 3.7722 | 0.9284 | 7.7300e-003 | 0.1897 | 0.0272 | 0.2169 | 0.0546 | 0.0260 | 0.0806 | | 814.7570 | 814.7570 | 0.0559 | | 816.1543 |
| Worker | 0.3472 | 0.2707 | 2.5448 | 6.1600e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 612.8643 | 612.8643 | 0.0195 | | 613.3521 |
| **Total** | **0.4902** | **4.0428** | **3.4732** | **0.0139** | **0.8058** | **0.0315** | **0.8373** | **0.2180** | **0.0300** | **0.2480** | | **1,427.6213** | **1,427.6213** | **0.0754** | | **1,429.5064** |

### 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | 0.0000 | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | **0.0000** | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

## 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 | 0.1430 | 3.7722 | 0.9284 | 7.7300e-003 | 0.1897 | 0.0272 | 0.2169 | 0.0546 | 0.0260 | 0.0806 | | 814.7570 | 814.7570 | 0.0559 | | 816.1543 |
| Worker | 0.3472 | 0.2707 | 2.5448 | 6.1600e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 612.8643 | 612.8643 | 0.0195 | | 613.3521 |
| **Total** | **0.4902** | **4.0428** | **3.4732** | **0.0139** | **0.8058** | **0.0315** | **0.8373** | **0.2180** | **0.0300** | **0.2480** | | **1,427.6213** | **1,427.6213** | **0.0754** | | **1,429.5064** |

## 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1297 | 3.5776 | 0.8535 | 7.6700e-003 | 0.1897 | 0.0231 | 0.2128 | 0.0546 | 0.0221 | 0.0767 | | 809.0709 | 809.0709 | 0.0534 | | 810.4069 |
| Worker | 0.3134 | 0.2376 | 2.2555 | 5.9800e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 594.9383 | 594.9383 | 0.0172 | | 595.3683 |
| **Total** | **0.4431** | **3.8151** | **3.1090** | **0.0137** | **0.8058** | **0.0273** | **0.8331** | **0.2180** | **0.0260** | **0.2440** | | **1,404.0092** | **1,404.0092** | **0.0706** | | **1,405.7752** |

## 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | 0.0000 | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | **0.0000** | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1297 | 3.5776 | 0.8535 | 7.6700e-003 | 0.1897 | 0.0231 | 0.2128 | 0.0546 | 0.0221 | 0.0767 | | 809.0709 | 809.0709 | 0.0534 | | 810.4069 |
| Worker | 0.3134 | 0.2376 | 2.2555 | 5.9800e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 594.9383 | 594.9383 | 0.0172 | | 595.3683 |
| **Total** | **0.4431** | **3.8151** | **3.1090** | **0.0137** | **0.8058** | **0.0273** | **0.8331** | **0.2180** | **0.0260** | **0.2440** | | **1,404.0092** | **1,404.0092** | **0.0706** | | **1,405.7752** |

# 3.4 Building Construction - 2020

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1083 | 3.2858 | 0.7650 | 7.6100e-003 | 0.1897 | 0.0154 | 0.2051 | 0.0546 | 0.0147 | 0.0694 | | 803.2435 | 803.2435 | 0.0495 | | 804.4816 |
| Worker | 0.2862 | 0.2100 | 2.0202 | 5.7900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 576.5314 | 576.5314 | 0.0151 | | 576.9076 |
| **Total** | **0.3945** | **3.4958** | **2.7852** | **0.0134** | **0.8058** | **0.0195** | **0.8253** | **0.2181** | **0.0185** | **0.2366** | | **1,379.7748** | **1,379.7748** | **0.0646** | | **1,381.3891** |

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | 0.0000 | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | **0.0000** | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1083 | 3.2858 | 0.7650 | 7.6100e-003 | 0.1897 | 0.0154 | 0.2051 | 0.0546 | 0.0147 | 0.0694 | | 803.2435 | 803.2435 | 0.0495 | | 804.4816 |
| Worker | 0.2862 | 0.2100 | 2.0202 | 5.7900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 576.5314 | 576.5314 | 0.0151 | | 576.9076 |
| **Total** | **0.3945** | **3.4958** | **2.7852** | **0.0134** | **0.8058** | **0.0195** | **0.8253** | **0.2181** | **0.0185** | **0.2366** | | **1,379.7748** | **1,379.7748** | **0.0646** | | **1,381.3891** |

## 3.5 Paving - 2020

### 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

### 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

### 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | 0.0000 | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | **0.0000** | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

# 3.6 Architectural Coating - 2020

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

Improve Pedestrian Network

| | 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 | 0.6732 | 4.3999 | 7.7877 | 0.0246 | 1.8984 | 0.0303 | 1.9286 | 0.5087 | 0.0286 | 0.5373 | | 2,494.6671 | 2,494.6671 | 0.1207 | | 2,497.6837 |
| Unmitigated | 0.6782 | 4.4475 | 7.8951 | 0.0251 | 1.9371 | 0.0308 | 1.9679 | 0.5191 | 0.0291 | 0.5482 | | 2,540.7413 | 2,540.7413 | 0.1220 | | 2,543.7912 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | | |
| Single Family Housing | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |
| Total | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |

## 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 |
| Other Asphalt Surfaces | 9.50 | 7.30 | 7.30 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Single Family Housing | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |
| Single Family Housing | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |

## 5.0 Energy Detail

Historical Energy Use: N

### 5.1 Mitigation Measures Energy

| | 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 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| NaturalGas Unmitigated | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |

### 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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3105.58 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

**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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3.10558 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use only Natural Gas Hearths

| | 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 | 3.8489 | 0.2258 | 3.2856 | 1.3700e-003 | | 0.0329 | 0.0329 | | 0.0329 | 0.0329 | 0.0000 | 246.6244 | 246.6244 | 0.0102 | 4.4200e-003 | 248.1951 |
| Unmitigated | 4.8071 | 0.3678 | 11.9980 | 0.0297 | | 1.4505 | 1.4505 | | 1.4505 | 1.4505 | 209.2203 | 246.6766 | 455.8969 | 0.9883 | 4.4200e-003 | 481.9212 |

## 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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.9789 | 0.3304 | 8.7695 | 0.0296 | | 1.4327 | 1.4327 | | 1.4327 | 1.4327 | 209.2203 | 240.8824 | 450.1026 | 0.9827 | 4.4200e-003 | 475.9856 |
| Landscaping | 0.0983 | 0.0373 | 3.2286 | 1.7000e-004 | | 0.0178 | 0.0178 | | 0.0178 | 0.0178 | | 5.7943 | 5.7943 | 5.6500e-003 | | 5.9356 |
| **Total** | **4.8071** | **0.3678** | **11.9981** | **0.0297** | | **1.4505** | **1.4505** | | **1.4505** | **1.4505** | **209.2203** | **246.6766** | **455.8969** | **0.9883** | **4.4200e-003** | **481.9212** |

**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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.0221 | 0.1887 | 0.0803 | 1.2000e-003 | | 0.0153 | 0.0153 | | 0.0153 | 0.0153 | 0.0000 | 240.8824 | 240.8824 | 4.6200e-003 | 4.4200e-003 | 242.3138 |
| Landscaping | 0.0969 | 0.0371 | 3.2053 | 1.7000e-004 | | 0.0176 | 0.0176 | | 0.0176 | 0.0176 | | 5.7421 | 5.7421 | 5.5700e-003 | | 5.8813 |
| **Total** | **3.8489** | **0.2258** | **3.2856** | **1.3700e-003** | | **0.0329** | **0.0329** | | **0.0329** | **0.0329** | **0.0000** | **246.6244** | **246.6244** | **0.0102** | **4.4200e-003** | **248.1951** |

## 7.0 Water Detail

### 7.1 Mitigation Measures Water

## 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

# 2148.0015 Spotorno Ranch - Tier III Mitigated Construction

**Alameda County, Annual**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard
Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite

Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Tier III mitigation for equipment > 50 HP
Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 3.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 4.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 9.00 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |

| | | | |
|---|---|---|---|
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 0.1644 | 1.8370 | 1.0454 | 1.8500e-003 | 0.3359 | 0.0858 | 0.4218 | 0.1768 | 0.0790 | 0.2558 | 0.0000 | 168.7705 | 168.7705 | 0.0510 | 0.0000 | 170.0448 |
| 2019 | 0.3616 | 3.2464 | 2.6287 | 5.3200e-003 | 0.1014 | 0.1719 | 0.2733 | 0.0275 | 0.1616 | 0.1892 | 0.0000 | 475.1323 | 475.1323 | 0.0828 | 0.0000 | 477.2014 |
| 2020 | 1.3069 | 2.2945 | 2.0395 | 4.0900e-003 | 0.0733 | 0.1163 | 0.1896 | 0.0199 | 0.1092 | 0.1291 | 0.0000 | 362.1720 | 362.1720 | 0.0671 | 0.0000 | 363.8487 |
| **Maximum** | **1.3069** | **3.2464** | **2.6287** | **5.3200e-003** | **0.3359** | **0.1719** | **0.4218** | **0.1768** | **0.1616** | **0.2558** | **0.0000** | **475.1323** | **475.1323** | **0.0828** | **0.0000** | **477.2014** |

### 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 | 0.0470 | 0.8764 | 1.0873 | 1.8500e-003 | 0.1541 | 0.0392 | 0.1933 | 0.0803 | 0.0392 | 0.1195 | 0.0000 | 168.7703 | 168.7703 | 0.0510 | 0.0000 | 170.0446 |
| 2019 | 0.1779 | 2.3434 | 2.7618 | 5.3200e-003 | 0.1014 | 0.1211 | 0.2225 | 0.0275 | 0.1209 | 0.1485 | 0.0000 | 475.1320 | 475.1320 | 0.0828 | 0.0000 | 477.2011 |
| 2020 | 1.1821 | 1.7882 | 2.2011 | 4.0900e-003 | 0.0733 | 0.0931 | 0.1664 | 0.0199 | 0.0930 | 0.1129 | 0.0000 | 362.1717 | 362.1717 | 0.0671 | 0.0000 | 363.8484 |
| **Maximum** | **1.1821** | **2.3434** | **2.7618** | **5.3200e-003** | **0.1541** | **0.1211** | **0.2225** | **0.0803** | **0.1209** | **0.1485** | **0.0000** | **475.1320** | **475.1320** | **0.0828** | **0.0000** | **477.2011** |

| | **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** | **23.24** | **32.12** | **-5.89** | **0.00** | **35.61** | **32.23** | **34.18** | **43.02** | **27.62** | **33.63** | **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 | 10-10-2018 | 1-9-2019 | 1.9005 | 0.9182 |
| 2 | 1-10-2019 | 4-9-2019 | 0.8900 | 0.6223 |
| 3 | 4-10-2019 | 7-9-2019 | 0.8967 | 0.6261 |
| 4 | 7-10-2019 | 10-9-2019 | 0.9069 | 0.6333 |
| 5 | 10-10-2019 | 1-9-2020 | 0.9020 | 0.6350 |
| 6 | 1-10-2020 | 4-9-2020 | 0.8186 | 0.6142 |
| 7 | 4-10-2020 | 7-9-2020 | 0.8159 | 0.6116 |
| 8 | 7-10-2020 | 9-30-2020 | 0.6579 | 0.4967 |
| | | Highest | 1.9005 | 0.9182 |

## 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking**

**OffRoad Equipment**

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 0.1807 | 0.0000 | 0.1807 | 0.0993 | 0.0000 | 0.0993 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0456 | 0.4820 | 0.2248 | 3.8000e-004 | | 0.0258 | 0.0258 | | 0.0237 | 0.0237 | 0.0000 | 34.7599 | 34.7599 | 0.0108 | 0.0000 | 35.0304 |
| **Total** | **0.0456** | **0.4820** | **0.2248** | **3.8000e-004** | **0.1807** | **0.0258** | **0.2064** | **0.0993** | **0.0237** | **0.1230** | **0.0000** | **34.7599** | **34.7599** | **0.0108** | **0.0000** | **35.0304** |

### 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 | 7.5000e-004 | 5.9000e-004 | 5.9100e-003 | 1.0000e-005 | 1.4200e-003 | 1.0000e-005 | 1.4300e-003 | 3.8000e-004 | 1.0000e-005 | 3.9000e-004 | 0.0000 | 1.3449 | 1.3449 | 4.0000e-005 | 0.0000 | 1.3459 |
| **Total** | **7.5000e-004** | **5.9000e-004** | **5.9100e-003** | **1.0000e-005** | **1.4200e-003** | **1.0000e-005** | **1.4300e-003** | **3.8000e-004** | **1.0000e-005** | **3.9000e-004** | **0.0000** | **1.3449** | **1.3449** | **4.0000e-005** | **0.0000** | **1.3459** |

### 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 | | | | | 0.0813 | 0.0000 | 0.0813 | 0.0447 | 0.0000 | 0.0447 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 9.3100e-003 | 0.1907 | 0.2296 | 3.8000e-004 | | 9.4600e-003 | 9.4600e-003 | | 9.4600e-003 | 9.4600e-003 | 0.0000 | 34.7599 | 34.7599 | 0.0108 | 0.0000 | 35.0304 |
| **Total** | **9.3100e-003** | **0.1907** | **0.2296** | **3.8000e-004** | **0.0813** | **9.4600e-003** | **0.0908** | **0.0447** | **9.4600e-003** | **0.0542** | **0.0000** | **34.7599** | **34.7599** | **0.0108** | **0.0000** | **35.0304** |

## 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 | 7.5000e-004 | 5.9000e-004 | 5.9100e-003 | 1.0000e-005 | 1.4200e-003 | 1.0000e-005 | 1.4300e-003 | 3.8000e-004 | 1.0000e-005 | 3.9000e-004 | 0.0000 | 1.3449 | 1.3449 | 4.0000e-005 | 0.0000 | 1.3459 |
| **Total** | **7.5000e-004** | **5.9000e-004** | **5.9100e-003** | **1.0000e-005** | **1.4200e-003** | **1.0000e-005** | **1.4300e-003** | **3.8000e-004** | **1.0000e-005** | **3.9000e-004** | **0.0000** | **1.3449** | **1.3449** | **4.0000e-005** | **0.0000** | **1.3459** |

# 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 | | | | | 0.1499 | 0.0000 | 0.1499 | 0.0760 | 0.0000 | 0.0760 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.1145 | 1.3392 | 0.7895 | 1.4000e-003 | | 0.0593 | 0.0593 | | 0.0545 | 0.0545 | 0.0000 | 127.4591 | 127.4591 | 0.0397 | 0.0000 | 128.4511 |
| **Total** | **0.1145** | **1.3392** | **0.7895** | **1.4000e-003** | **0.1499** | **0.0593** | **0.2092** | **0.0760** | **0.0545** | **0.1306** | **0.0000** | **127.4591** | **127.4591** | **0.0397** | **0.0000** | **128.4511** |

## 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 | 1.8900e-003 | 1.4800e-003 | 0.0148 | 4.0000e-005 | 3.5600e-003 | 3.0000e-005 | 3.5800e-003 | 9.5000e-004 | 2.0000e-005 | 9.7000e-004 | 0.0000 | 3.3621 | 3.3621 | 1.1000e-004 | 0.0000 | 3.3648 |
| **Total** | **1.8900e-003** | **1.4800e-003** | **0.0148** | **4.0000e-005** | **3.5600e-003** | **3.0000e-005** | **3.5800e-003** | **9.5000e-004** | **2.0000e-005** | **9.7000e-004** | **0.0000** | **3.3621** | **3.3621** | **1.1000e-004** | **0.0000** | **3.3648** |

## 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 | | | | | 0.0675 | 0.0000 | 0.0675 | 0.0342 | 0.0000 | 0.0342 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 0.0343 | 0.6745 | 0.8263 | 1.4000e-003 | | 0.0292 | 0.0292 | | 0.0292 | 0.0292 | 0.0000 | 127.4590 | 127.4590 | 0.0397 | 0.0000 | 128.4510 |
| **Total** | **0.0343** | **0.6745** | **0.8263** | **1.4000e-003** | **0.0675** | **0.0292** | **0.0967** | **0.0342** | **0.0292** | **0.0635** | **0.0000** | **127.4590** | **127.4590** | **0.0397** | **0.0000** | **128.4510** |

## 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 | 1.8900e-003 | 1.4800e-003 | 0.0148 | 4.0000e-005 | 3.5600e-003 | 3.0000e-005 | 3.5800e-003 | 9.5000e-004 | 2.0000e-005 | 9.7000e-004 | 0.0000 | 3.3621 | 3.3621 | 1.1000e-004 | 0.0000 | 3.3648 |
| **Total** | **1.8900e-003** | **1.4800e-003** | **0.0148** | **4.0000e-005** | **3.5600e-003** | **3.0000e-005** | **3.5800e-003** | **9.5000e-004** | **2.0000e-005** | **9.7000e-004** | **0.0000** | **3.3621** | **3.3621** | **1.1000e-004** | **0.0000** | **3.3648** |

# 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 | 1.3400e-003 | 0.0117 | 8.7900e-003 | 1.0000e-005 | | 7.5000e-004 | 7.5000e-004 | | 7.0000e-004 | 7.0000e-004 | 0.0000 | 1.1888 | 1.1888 | 2.9000e-004 | 0.0000 | 1.1961 |
| **Total** | **1.3400e-003** | **0.0117** | **8.7900e-003** | **1.0000e-005** | | **7.5000e-004** | **7.5000e-004** | | **7.0000e-004** | **7.0000e-004** | **0.0000** | **1.1888** | **1.1888** | **2.9000e-004** | **0.0000** | **1.1961** |

## 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 | 7.0000e-005 | 1.8900e-003 | 4.3000e-004 | 0.0000 | 9.0000e-005 | 1.0000e-005 | 1.1000e-004 | 3.0000e-005 | 1.0000e-005 | 4.0000e-005 | 0.0000 | 0.3755 | 0.3755 | 2.0000e-005 | 0.0000 | 0.3761 |
| Worker | 1.6000e-004 | 1.2000e-004 | 1.2300e-003 | 0.0000 | 3.0000e-004 | 0.0000 | 3.0000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2802 | 0.2802 | 1.0000e-005 | 0.0000 | 0.2804 |
| **Total** | **2.3000e-004** | **2.0100e-003** | **1.6600e-003** | **0.0000** | **3.9000e-004** | **1.0000e-005** | **4.1000e-004** | **1.1000e-004** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **0.6557** | **0.6557** | **3.0000e-005** | **0.0000** | **0.6565** |

## 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 | 5.0000e-004 | 7.1100e-003 | 9.1200e-003 | 1.0000e-005 | | 4.6000e-004 | 4.6000e-004 | | 4.6000e-004 | 4.6000e-004 | 0.0000 | 1.1888 | 1.1888 | 2.9000e-004 | 0.0000 | 1.1961 |
| **Total** | **5.0000e-004** | **7.1100e-003** | **9.1200e-003** | **1.0000e-005** | | **4.6000e-004** | **4.6000e-004** | | **4.6000e-004** | **4.6000e-004** | **0.0000** | **1.1888** | **1.1888** | **2.9000e-004** | **0.0000** | **1.1961** |

## 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 | 7.0000e-005 | 1.8900e-003 | 4.3000e-004 | 0.0000 | 9.0000e-005 | 1.0000e-005 | 1.1000e-004 | 3.0000e-005 | 1.0000e-005 | 4.0000e-005 | 0.0000 | 0.3755 | 0.3755 | 2.0000e-005 | 0.0000 | 0.3761 |
| Worker | 1.6000e-004 | 1.2000e-004 | 1.2300e-003 | 0.0000 | 3.0000e-004 | 0.0000 | 3.0000e-004 | 8.0000e-005 | 0.0000 | 8.0000e-005 | 0.0000 | 0.2802 | 0.2802 | 1.0000e-005 | 0.0000 | 0.2804 |
| **Total** | **2.3000e-004** | **2.0100e-003** | **1.6600e-003** | **0.0000** | **3.9000e-004** | **1.0000e-005** | **4.1000e-004** | **1.1000e-004** | **1.0000e-005** | **1.2000e-004** | **0.0000** | **0.6557** | **0.6557** | **3.0000e-005** | **0.0000** | **0.6565** |

## 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 | 0.3081 | 2.7508 | 2.2399 | 3.5100e-003 | | 0.1683 | 0.1683 | | 0.1583 | 0.1583 | 0.0000 | 306.8110 | 306.8110 | 0.0747 | 0.0000 | 308.6795 |
| **Total** | **0.3081** | **2.7508** | **2.2399** | **3.5100e-003** | | **0.1683** | **0.1683** | | **0.1583** | **0.1583** | **0.0000** | **306.8110** | **306.8110** | **0.0747** | **0.0000** | **308.6795** |

### 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 | 0.0165 | 0.4673 | 0.1034 | 1.0200e-003 | 0.0240 | 2.9900e-003 | 0.0270 | 6.9400e-003 | 2.8600e-003 | 9.8000e-003 | 0.0000 | 97.3334 | 97.3334 | 6.0000e-003 | 0.0000 | 97.4833 |
| Worker | 0.0371 | 0.0283 | 0.2854 | 7.9000e-004 | 0.0774 | 5.5000e-004 | 0.0779 | 0.0206 | 5.1000e-004 | 0.0211 | 0.0000 | 70.9880 | 70.9880 | 2.0200e-003 | 0.0000 | 71.0386 |
| **Total** | **0.0535** | **0.4956** | **0.3888** | **1.8100e-003** | **0.1014** | **3.5400e-003** | **0.1049** | **0.0275** | **3.3700e-003** | **0.0309** | **0.0000** | **168.3214** | **168.3214** | **8.0200e-003** | **0.0000** | **168.5219** |

### 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 | 0.1244 | 1.8479 | 2.3730 | 3.5100e-003 | | 0.1176 | 0.1176 | | 0.1176 | 0.1176 | 0.0000 | 306.8106 | 306.8106 | 0.0747 | 0.0000 | 308.6792 |
| **Total** | **0.1244** | **1.8479** | **2.3730** | **3.5100e-003** | | **0.1176** | **0.1176** | | **0.1176** | **0.1176** | **0.0000** | **306.8106** | **306.8106** | **0.0747** | **0.0000** | **308.6792** |

## 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 | 0.0165 | 0.4673 | 0.1034 | 1.0200e-003 | 0.0240 | 2.9900e-003 | 0.0270 | 6.9400e-003 | 2.8600e-003 | 9.8000e-003 | 0.0000 | 97.3334 | 97.3334 | 6.0000e-003 | 0.0000 | 97.4833 |
| Worker | 0.0371 | 0.0283 | 0.2854 | 7.9000e-004 | 0.0774 | 5.5000e-004 | 0.0779 | 0.0206 | 5.1000e-004 | 0.0211 | 0.0000 | 70.9880 | 70.9880 | 2.0200e-003 | 0.0000 | 71.0386 |
| **Total** | **0.0535** | **0.4956** | **0.3888** | **1.8100e-003** | **0.1014** | **3.5400e-003** | **0.1049** | **0.0275** | **3.3700e-003** | **0.0309** | **0.0000** | **168.3214** | **168.3214** | **8.0200e-003** | **0.0000** | **168.5219** |

# 3.4 Building Construction - 2020

## 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 | 0.1887 | 1.7076 | 1.4995 | 2.4000e-003 | | 0.0994 | 0.0994 | | 0.0935 | 0.0935 | 0.0000 | 206.1329 | 206.1329 | 0.0503 | 0.0000 | 207.3901 |
| **Total** | **0.1887** | **1.7076** | **1.4995** | **2.4000e-003** | | **0.0994** | **0.0994** | | **0.0935** | **0.0935** | **0.0000** | **206.1329** | **206.1329** | **0.0503** | **0.0000** | **207.3901** |

## 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 | 9.3600e-003 | 0.2929 | 0.0631 | 6.9000e-004 | 0.0164 | 1.3600e-003 | 0.0177 | 4.7300e-003 | 1.3000e-003 | 6.0300e-003 | 0.0000 | 65.9160 | 65.9160 | 3.7900e-003 | 0.0000 | 66.0107 |
| Worker | 0.0231 | 0.0170 | 0.1747 | 5.2000e-004 | 0.0528 | 3.7000e-004 | 0.0531 | 0.0140 | 3.4000e-004 | 0.0144 | 0.0000 | 46.9156 | 46.9156 | 1.2100e-003 | 0.0000 | 46.9459 |
| **Total** | **0.0324** | **0.3100** | **0.2378** | **1.2100e-003** | **0.0692** | **1.7300e-003** | **0.0709** | **0.0188** | **1.6400e-003** | **0.0204** | **0.0000** | **112.8316** | **112.8316** | **5.0000e-003** | **0.0000** | **112.9566** |

## 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 | 0.0810 | 1.2555 | 1.6148 | 2.4000e-003 | | 0.0791 | 0.0791 | | 0.0791 | 0.0791 | 0.0000 | 206.1326 | 206.1326 | 0.0503 | 0.0000 | 207.3899 |
| **Total** | **0.0810** | **1.2555** | **1.6148** | **2.4000e-003** | | **0.0791** | **0.0791** | | **0.0791** | **0.0791** | **0.0000** | **206.1326** | **206.1326** | **0.0503** | **0.0000** | **207.3899** |

## 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 | 9.3600e-003 | 0.2929 | 0.0631 | 6.9000e-004 | 0.0164 | 1.3600e-003 | 0.0177 | 4.7300e-003 | 1.3000e-003 | 6.0300e-003 | 0.0000 | 65.9160 | 65.9160 | 3.7900e-003 | 0.0000 | 66.0107 |
| Worker | 0.0231 | 0.0170 | 0.1747 | 5.2000e-004 | 0.0528 | 3.7000e-004 | 0.0531 | 0.0140 | 3.4000e-004 | 0.0144 | 0.0000 | 46.9156 | 46.9156 | 1.2100e-003 | 0.0000 | 46.9459 |
| **Total** | **0.0324** | **0.3100** | **0.2378** | **1.2100e-003** | **0.0692** | **1.7300e-003** | **0.0709** | **0.0188** | **1.6400e-003** | **0.0204** | **0.0000** | **112.8316** | **112.8316** | **5.0000e-003** | **0.0000** | **112.9566** |

# 3.5 Paving - 2020

## 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 | 0.0237 | 0.2462 | 0.2564 | 4.0000e-004 | | 0.0132 | 0.0132 | | 0.0121 | 0.0121 | 0.0000 | 35.0494 | 35.0494 | 0.0113 | 0.0000 | 35.3328 |
| Paving | 5.1900e-003 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0289** | **0.2462** | **0.2564** | **4.0000e-004** | | **0.0132** | **0.0132** | | **0.0121** | **0.0121** | **0.0000** | **35.0494** | **35.0494** | **0.0113** | **0.0000** | **35.3328** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

## 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 | 9.8200e-003 | 0.1977 | 0.3027 | 4.0000e-004 | | 0.0107 | 0.0107 | | 0.0107 | 0.0107 | 0.0000 | 35.0493 | 35.0493 | 0.0113 | 0.0000 | 35.3327 |
| Paving | 5.1900e-003 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| **Total** | **0.0150** | **0.1977** | **0.3027** | **4.0000e-004** | | **0.0107** | **0.0107** | | **0.0107** | **0.0107** | **0.0000** | **35.0493** | **35.0493** | **0.0113** | **0.0000** | **35.3327** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

## 3.6 Architectural Coating - 2020

### 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 | 1.0508 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 4.2400e-003 | 0.0295 | 0.0321 | 5.0000e-005 | | 1.9400e-003 | 1.9400e-003 | | 1.9400e-003 | 1.9400e-003 | 0.0000 | 4.4682 | 4.4682 | 3.5000e-004 | 0.0000 | 4.4768 |
| **Total** | **1.0550** | **0.0295** | **0.0321** | **5.0000e-005** | | **1.9400e-003** | **1.9400e-003** | | **1.9400e-003** | **1.9400e-003** | **0.0000** | **4.4682** | **4.4682** | **3.5000e-004** | **0.0000** | **4.4768** |

### 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

### 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 | 1.0508 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Off-Road | 1.0400e-003 | 0.0238 | 0.0321 | 5.0000e-005 | | 1.6600e-003 | 1.6600e-003 | | 1.6600e-003 | 1.6600e-003 | 0.0000 | 4.4682 | 4.4682 | 3.5000e-004 | 0.0000 | 4.4768 |
| **Total** | **1.0518** | **0.0238** | **0.0321** | **5.0000e-005** | | **1.6600e-003** | **1.6600e-003** | | **1.6600e-003** | **1.6600e-003** | **0.0000** | **4.4682** | **4.4682** | **3.5000e-004** | **0.0000** | **4.4768** |

## 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 | 9.1000e-004 | 6.7000e-004 | 6.8700e-003 | 2.0000e-005 | 2.0800e-003 | 1.0000e-005 | 2.0900e-003 | 5.5000e-004 | 1.0000e-005 | 5.7000e-004 | 0.0000 | 1.8450 | 1.8450 | 5.0000e-005 | 0.0000 | 1.8462 |
| **Total** | **9.1000e-004** | **6.7000e-004** | **6.8700e-003** | **2.0000e-005** | **2.0800e-003** | **1.0000e-005** | **2.0900e-003** | **5.5000e-004** | **1.0000e-005** | **5.7000e-004** | **0.0000** | **1.8450** | **1.8450** | **5.0000e-005** | **0.0000** | **1.8462** |

# 2148.0015 Spotorno Ranch - Tier III Mitigated Construction

**Alameda County, Summer**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard
Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite
Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Tier III mitigation for equipment > 50 HP
Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |

| | | | |
|---|---|---|---|
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 3.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 4.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 9.00 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |

| | | | |
|---|---|---|---|
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 5.1786 | 59.5798 | 35.8006 | 0.0638 | 18.2141 | 2.6349 | 20.7921 | 9.9699 | 2.4241 | 12.3416 | 0.0000 | 6,422.0032 | 6,422.0032 | 1.9495 | 0.0000 | 6,470.7400 |
| 2019 | 2.7851 | 24.8052 | 20.2806 | 0.0413 | 0.8058 | 1.3168 | 2.1227 | 0.2180 | 1.2384 | 1.4564 | 0.0000 | 4,069.7149 | 4,069.7149 | 0.6981 | 0.0000 | 4,087.1663 |
| 2020 | 60.3420 | 22.6088 | 19.6488 | 0.0410 | 0.8058 | 1.1363 | 1.9422 | 0.2181 | 1.0686 | 1.2867 | 0.0000 | 4,005.5245 | 4,005.5245 | 0.7172 | 0.0000 | 4,022.6206 |
| **Maximum** | **60.3420** | **59.5798** | **35.8006** | **0.0638** | **18.2141** | **2.6349** | **20.7921** | **9.9699** | **2.4241** | **12.3416** | **0.0000** | **6,422.0032** | **6,422.0032** | **1.9495** | **0.0000** | **6,470.7400** |

### 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 | 1.6116 | 30.0362 | 37.4338 | 0.0638 | 8.2777 | 1.3006 | 9.2249 | 4.5080 | 1.3005 | 5.4552 | 0.0000 | 6,422.0032 | 6,422.0032 | 1.9495 | 0.0000 | 6,470.7400 |
| 2019 | 1.3772 | 17.8864 | 21.3009 | 0.0413 | 0.8058 | 0.9280 | 1.7338 | 0.2180 | 0.9266 | 1.1447 | 0.0000 | 4,069.7149 | 4,069.7149 | 0.6981 | 0.0000 | 4,087.1663 |
| 2020 | 60.1593 | 17.5298 | 20.9442 | 0.0410 | 0.8058 | 0.9075 | 1.7133 | 0.2181 | 0.9065 | 1.1246 | 0.0000 | 4,005.5245 | 4,005.5245 | 0.7172 | 0.0000 | 4,022.6206 |
| **Maximum** | **60.1593** | **30.0362** | **37.4338** | **0.0638** | **8.2777** | **1.3006** | **9.2249** | **4.5080** | **1.3005** | **5.4552** | **0.0000** | **6,422.0032** | **6,422.0032** | **1.9495** | **0.0000** | **6,470.7400** |

| | **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** | **7.55** | **38.83** | **-5.21** | **0.00** | **50.12** | **38.36** | **49.02** | **52.49** | **33.77** | **48.79** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

**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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 18.0663 | 0.0000 | 18.0663 | 9.9307 | 0.0000 | 9.9307 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **18.0663** | **2.5769** | **20.6432** | **9.9307** | **2.3708** | **12.3014** | | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

**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 | 0.0796 | 0.0522 | 0.6401 | 1.6100e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 159.8173 | 159.8173 | 4.9500e-003 | | 159.9410 |
| **Total** | **0.0796** | **0.0522** | **0.6401** | **1.6100e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **159.8173** | **159.8173** | **4.9500e-003** | | **159.9410** |

## 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 | | | | | 8.1298 | 0.0000 | 8.1298 | 4.4688 | 0.0000 | 4.4688 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.9312 | 19.0656 | 22.9600 | 0.0380 | | 0.9462 | 0.9462 | | 0.9462 | 0.9462 | 0.0000 | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **0.9312** | **19.0656** | **22.9600** | **0.0380** | **8.1298** | **0.9462** | **9.0760** | **4.4688** | **0.9462** | **5.4150** | **0.0000** | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

## 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 | 0.0796 | 0.0522 | 0.6401 | 1.6100e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 159.8173 | 159.8173 | 4.9500e-003 | | 159.9410 |
| **Total** | **0.0796** | **0.0522** | **0.6401** | **1.6100e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **159.8173** | **159.8173** | **4.9500e-003** | | **159.9410** |

# 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 | | | | | 6.6622 | 0.0000 | 6.6622 | 3.3793 | 0.0000 | 3.3793 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **6.6622** | **2.6337** | **9.2959** | **3.3793** | **2.4230** | **5.8024** | | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0885 | 0.0580 | 0.7112 | 1.7800e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 177.5748 | 177.5748 | 5.5000e-003 | | 177.7122 |
| **Total** | **0.0885** | **0.0580** | **0.7112** | **1.7800e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **177.5748** | **177.5748** | **5.5000e-003** | | **177.7122** |

## 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 | | | | | 2.9980 | 0.0000 | 2.9980 | 1.5207 | 0.0000 | 1.5207 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5231 | 29.9782 | 36.7226 | 0.0620 | | 1.2994 | 1.2994 | | 1.2994 | 1.2994 | 0.0000 | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **1.5231** | **29.9782** | **36.7226** | **0.0620** | **2.9980** | **1.2994** | **4.2974** | **1.5207** | **1.2994** | **2.8201** | **0.0000** | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0885 | 0.0580 | 0.7112 | 1.7800e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 177.5748 | 177.5748 | 5.5000e-003 | | 177.7122 |
| **Total** | **0.0885** | **0.0580** | **0.7112** | **1.7800e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **177.5748** | **177.5748** | **5.5000e-003** | | **177.7122** |

## 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

### 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 | 0.1366 | 3.7236 | 0.8057 | 7.9400e-003 | 0.1897 | 0.0268 | 0.2165 | 0.0546 | 0.0256 | 0.0802 | | 837.2392 | 837.2392 | 0.0507 | | 838.5063 |
| Worker | 0.3318 | 0.2176 | 2.6669 | 6.6900e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 665.9054 | 665.9054 | 0.0206 | | 666.4207 |
| **Total** | **0.4684** | **3.9412** | **3.4725** | **0.0146** | **0.8058** | **0.0311** | **0.8369** | **0.2180** | **0.0296** | **0.2477** | | **1,503.1447** | **1,503.1447** | **0.0713** | | **1,504.9270** |

### 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 | 1.0098 | 14.2177 | 18.2359 | 0.0269 | | 0.9149 | 0.9149 | | 0.9149 | 0.9149 | 0.0000 | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **1.0098** | **14.2177** | **18.2359** | **0.0269** | | **0.9149** | **0.9149** | | **0.9149** | **0.9149** | **0.0000** | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

## 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 | 0.1366 | 3.7236 | 0.8057 | 7.9400e-003 | 0.1897 | 0.0268 | 0.2165 | 0.0546 | 0.0256 | 0.0802 | | 837.2392 | 837.2392 | 0.0507 | | 838.5063 |
| Worker | 0.3318 | 0.2176 | 2.6669 | 6.6900e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 665.9054 | 665.9054 | 0.0206 | | 666.4207 |
| **Total** | **0.4684** | **3.9412** | **3.4725** | **0.0146** | **0.8058** | **0.0311** | **0.8369** | **0.2180** | **0.0296** | **0.2477** | | **1,503.1447** | **1,503.1447** | **0.0713** | | **1,504.9270** |

# 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1238 | 3.5354 | 0.7394 | 7.8900e-003 | 0.1897 | 0.0227 | 0.2125 | 0.0546 | 0.0218 | 0.0764 | | 831.6429 | 831.6429 | 0.0485 | | 832.8550 |
| Worker | 0.3001 | 0.1910 | 2.3775 | 6.4900e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 646.4918 | 646.4918 | 0.0182 | | 646.9479 |
| **Total** | **0.4240** | **3.7264** | **3.1168** | **0.0144** | **0.8058** | **0.0270** | **0.8328** | **0.2180** | **0.0257** | **0.2437** | | **1,478.1347** | **1,478.1347** | **0.0667** | | **1,479.8029** |

## 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 | 0.9532 | 14.1600 | 18.1841 | 0.0269 | | 0.9010 | 0.9010 | | 0.9010 | 0.9010 | 0.0000 | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **0.9532** | **14.1600** | **18.1841** | **0.0269** | | **0.9010** | **0.9010** | | **0.9010** | **0.9010** | **0.0000** | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1238 | 3.5354 | 0.7394 | 7.8900e-003 | 0.1897 | 0.0227 | 0.2125 | 0.0546 | 0.0218 | 0.0764 | | 831.6429 | 831.6429 | 0.0485 | | 832.8550 |
| Worker | 0.3001 | 0.1910 | 2.3775 | 6.4900e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 646.4918 | 646.4918 | 0.0182 | | 646.9479 |
| **Total** | **0.4240** | **3.7264** | **3.1168** | **0.0144** | **0.8058** | **0.0270** | **0.8328** | **0.2180** | **0.0257** | **0.2437** | | **1,478.1347** | **1,478.1347** | **0.0667** | | **1,479.8029** |

# 3.4 Building Construction - 2020

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1030 | 3.2539 | 0.6608 | 7.8300e-003 | 0.1897 | 0.0152 | 0.2049 | 0.0546 | 0.0145 | 0.0691 | | 825.9402 | 825.9402 | 0.0449 | | 827.0635 |
| Worker | 0.2744 | 0.1689 | 2.1395 | 6.2900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 626.5213 | 626.5213 | 0.0161 | | 626.9227 |
| **Total** | **0.3774** | **3.4228** | **2.8003** | **0.0141** | **0.8058** | **0.0193** | **0.8251** | **0.2181** | **0.0183** | **0.2363** | | **1,452.4615** | **1,452.4615** | **0.0610** | | **1,453.9862** |

## 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 | 0.9101 | 14.1070 | 18.1439 | 0.0269 | | 0.8882 | 0.8882 | | 0.8882 | 0.8882 | 0.0000 | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **0.9101** | **14.1070** | **18.1439** | **0.0269** | | **0.8882** | **0.8882** | | **0.8882** | **0.8882** | **0.0000** | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1030 | 3.2539 | 0.6608 | 7.8300e-003 | 0.1897 | 0.0152 | 0.2049 | 0.0546 | 0.0145 | 0.0691 | | 825.9402 | 825.9402 | 0.0449 | | 827.0635 |
| Worker | 0.2744 | 0.1689 | 2.1395 | 6.2900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 626.5213 | 626.5213 | 0.0161 | | 626.9227 |
| **Total** | **0.3774** | **3.4228** | **2.8003** | **0.0141** | **0.8058** | **0.0193** | **0.8251** | **0.2181** | **0.0183** | **0.2363** | | **1,452.4615** | **1,452.4615** | **0.0610** | | **1,453.9862** |

## 3.5 Paving - 2020

### 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

### 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

### 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 | 0.5609 | 11.2952 | 17.2957 | 0.0228 | | 0.6093 | 0.6093 | | 0.6093 | 0.6093 | 0.0000 | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8574** | **11.2952** | **17.2957** | **0.0228** | | **0.6093** | **0.6093** | | **0.6093** | **0.6093** | **0.0000** | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

## 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

# 3.6 Architectural Coating - 2020

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.0594 | 1.3570 | 1.8324 | 2.9700e-003 | | 0.0951 | 0.0951 | | 0.0951 | 0.0951 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.1044** | **1.3570** | **1.8324** | **2.9700e-003** | | **0.0951** | **0.0951** | | **0.0951** | **0.0951** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0549 | 0.0338 | 0.4279 | 1.2600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 125.3043 | 125.3043 | 3.2100e-003 | | 125.3845 |
| **Total** | **0.0549** | **0.0338** | **0.4279** | **1.2600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **125.3043** | **125.3043** | **3.2100e-003** | | **125.3845** |

# 2148.0015 Spotorno Ranch - Tier III Mitigated Construction

**Alameda County, Winter**

## 1.0 Project Characteristics

### 1.1 Land Usage

| Land Uses | Size | Metric | Lot Acreage | Floor Surface Area | Population |
|---|---|---|---|---|---|
| Other Asphalt Surfaces | 3.31 | Acre | 3.96 | 144,183.60 | 0 |
| Single Family Housing | 39.00 | Dwelling Unit | 23.25 | 145,000.00 | 112 |

### 1.2 Other Project Characteristics

| | | | | | |
|---|---|---|---|---|---|
| **Urbanization** | Urban | **Wind Speed (m/s)** | 2.2 | **Precipitation Freq (Days)** | 63 |
| **Climate Zone** | 4 | | | **Operational Year** | 2020 |
| **Utility Company** | Pacific Gas & Electric Company | | | | |
| **CO2 Intensity (lb/MWhr)** | 491.65 | **CH4 Intensity (lb/MWhr)** | 0.022 | **N2O Intensity (lb/MWhr)** | 0.005 |

### 1.3 User Entered Comments & Non-Default Data

Project Characteristics - 2148.0015 Spotorno Ranch
Utility information adjusted based Renewable Portfolio Standard

Land Use - Based on site plan and project description

Grading - Area to be disturbed: 27.16 acres
Cut and fill to be balanced onsite

Vehicle Trips - Trip rates from the Spotorno Property Transportation Assessment prepared by Fehr & Peers, March 2018

Woodstoves - No woodburning fireplaces

Construction Off-road Equipment Mitigation - Tier III mitigation for equipment > 50 HP
Compliance with BAAQMD best management practices threshold for fugitive dust; recommended measures from BAAQMD's Basic Construction Mitigation Measures Recommended for All Proposed Projects.

| Table Name | Column Name | Default Value | New Value |
|---|---|---|---|
| tblConstDustMitigation | WaterUnpavedRoadVehicleSpeed | 0 | 15 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 3.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 1.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 4.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 2.00 |
| tblConstEquipMitigation | NumberOfEquipmentMitigated | 0.00 | 9.00 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblConstEquipMitigation | Tier | No Change | Tier 3 |
| tblFireplaces | FireplaceWoodMass | 228.80 | 0.00 |
| tblFireplaces | NumberWood | 16.77 | 0.00 |
| tblGrading | AcresOfGrading | 112.50 | 27.16 |
| tblLandUse | LandUseSquareFeet | 70,200.00 | 145,000.00 |
| tblLandUse | LotAcreage | 3.31 | 3.96 |
| tblLandUse | LotAcreage | 12.66 | 23.25 |

| | | | |
|---|---|---|---|
| tblProjectCharacteristics | CH4IntensityFactor | 0.029 | 0.022 |
| tblProjectCharacteristics | CO2IntensityFactor | 641.35 | 491.65 |
| tblProjectCharacteristics | N2OIntensityFactor | 0.006 | 0.005 |
| tblVehicleTrips | ST_TR | 9.91 | 10.08 |
| tblVehicleTrips | SU_TR | 8.62 | 10.08 |
| tblVehicleTrips | WD_TR | 9.52 | 9.44 |

# 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 | 5.1827 | 59.5940 | 35.7680 | 0.0637 | 18.2141 | 2.6349 | 20.7921 | 9.9699 | 2.4241 | 12.3416 | 0.0000 | 6,407.8589 | 6,407.8589 | 1.9492 | 0.0000 | 6,456.5884 |
| 2019 | 2.8042 | 24.8939 | 20.2728 | 0.0406 | 0.8058 | 1.3172 | 2.1230 | 0.2180 | 1.2387 | 1.4567 | 0.0000 | 3,995.5893 | 3,995.5893 | 0.7020 | 0.0000 | 4,013.1387 |
| 2020 | 60.3444 | 22.6818 | 19.6337 | 0.0403 | 0.8058 | 1.1366 | 1.9424 | 0.2181 | 1.0689 | 1.2869 | 0.0000 | 3,932.8379 | 3,932.8379 | 0.7170 | 0.0000 | 3,950.0236 |
| **Maximum** | **60.3444** | **59.5940** | **35.7680** | **0.0637** | **18.2141** | **2.6349** | **20.7921** | **9.9699** | **2.4241** | **12.3416** | **0.0000** | **6,407.8589** | **6,407.8589** | **1.9492** | **0.0000** | **6,456.5884** |

### 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 | 1.6157 | 30.0504 | 37.4012 | 0.0637 | 8.2777 | 1.3006 | 9.2249 | 4.5080 | 1.3005 | 5.4552 | 0.0000 | 6,407.8589 | 6,407.8589 | 1.9492 | 0.0000 | 6,456.5884 |
| 2019 | 1.3962 | 17.9751 | 21.2931 | 0.0406 | 0.8058 | 0.9283 | 1.7341 | 0.2180 | 0.9270 | 1.1450 | 0.0000 | 3,995.5893 | 3,995.5893 | 0.7020 | 0.0000 | 4,013.1387 |
| 2020 | 60.1616 | 17.6028 | 20.9292 | 0.0403 | 0.8058 | 0.9077 | 1.7136 | 0.2181 | 0.9067 | 1.1248 | 0.0000 | 3,932.8379 | 3,932.8379 | 0.7170 | 0.0000 | 3,950.0236 |
| **Maximum** | **60.1616** | **30.0504** | **37.4012** | **0.0637** | **8.2777** | **1.3006** | **9.2249** | **4.5080** | **1.3005** | **5.4552** | **0.0000** | **6,407.8589** | **6,407.8589** | **1.9492** | **0.0000** | **6,456.5884** |

| | **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** | **7.55** | **38.76** | **-5.22** | **0.00** | **50.12** | **38.36** | **49.02** | **52.49** | **33.76** | **48.79** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

## 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 | 10/1/2018 | 10/26/2018 | 5 | 20 | |
| 2 | Grading | Grading | 10/27/2018 | 12/28/2018 | 5 | 45 | |
| 3 | Building Construction | Building Construction | 12/29/2018 | 9/4/2020 | 5 | 440 | |
| 4 | Paving | Paving | 9/5/2020 | 10/23/2020 | 5 | 35 | |
| 5 | Architectural Coating | Architectural Coating | 10/24/2020 | 12/11/2020 | 5 | 35 | |

**Acres of Grading (Site Preparation Phase): 0**

**Acres of Grading (Grading Phase): 27.16**

**Acres of Paving: 3.96**

**Residential Indoor: 293,625; Residential Outdoor: 97,875; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking**

### OffRoad Equipment

| Phase Name | Offroad Equipment Type | Amount | Usage Hours | Horse Power | Load Factor |
|---|---|---|---|---|---|
| Site Preparation | Rubber Tired Dozers | 3 | 8.00 | 247 | 0.40 |
| Site Preparation | Tractors/Loaders/Backhoes | 4 | 8.00 | 97 | 0.37 |
| Grading | Excavators | 2 | 8.00 | 158 | 0.38 |
| Grading | Graders | 1 | 8.00 | 187 | 0.41 |
| Grading | Rubber Tired Dozers | 1 | 8.00 | 247 | 0.40 |
| Grading | Scrapers | 2 | 8.00 | 367 | 0.48 |
| Grading | Tractors/Loaders/Backhoes | 2 | 8.00 | 97 | 0.37 |
| Building Construction | Cranes | 1 | 7.00 | 231 | 0.29 |
| Building Construction | Forklifts | 3 | 8.00 | 89 | 0.20 |
| Building Construction | Generator Sets | 1 | 8.00 | 84 | 0.74 |
| Building Construction | Tractors/Loaders/Backhoes | 3 | 7.00 | 97 | 0.37 |
| Building Construction | Welders | 1 | 8.00 | 46 | 0.45 |
| Paving | Pavers | 2 | 8.00 | 130 | 0.42 |
| Paving | Paving Equipment | 2 | 8.00 | 132 | 0.36 |
| Paving | Rollers | 2 | 8.00 | 80 | 0.38 |
| Architectural Coating | Air Compressors | 1 | 6.00 | 78 | 0.48 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| Site Preparation | 7 | 18.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Grading | 8 | 20.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Building Construction | 9 | 75.00 | 28.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Paving | 6 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |
| Architectural Coating | 1 | 15.00 | 0.00 | 0.00 | 10.80 | 7.30 | 20.00 | LD_Mix | HDT_Mix | HHDT |

## 3.1 Mitigation Measures Construction

Use Cleaner Engines for Construction Equipment

Water Exposed Area

Reduce Vehicle Speed on Unpaved 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 | | | | | 18.0663 | 0.0000 | 18.0663 | 9.9307 | 0.0000 | 9.9307 | | | 0.0000 | | | 0.0000 |
| Off-Road | 4.5627 | 48.1988 | 22.4763 | 0.0380 | | 2.5769 | 2.5769 | | 2.3708 | 2.3708 | | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **4.5627** | **48.1988** | **22.4763** | **0.0380** | **18.0663** | **2.5769** | **20.6432** | **9.9307** | **2.3708** | **12.3014** | | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

### 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 | 0.0833 | 0.0650 | 0.6107 | 1.4800e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 147.0874 | 147.0874 | 4.6800e-003 | | 147.2045 |
| **Total** | **0.0833** | **0.0650** | **0.6107** | **1.4800e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **147.0874** | **147.0874** | **4.6800e-003** | | **147.2045** |

## 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 | | | | | 8.1298 | 0.0000 | 8.1298 | 4.4688 | 0.0000 | 4.4688 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.9312 | 19.0656 | 22.9600 | 0.0380 | | 0.9462 | 0.9462 | | 0.9462 | 0.9462 | 0.0000 | 3,831.6239 | 3,831.6239 | 1.1928 | | 3,861.4448 |
| **Total** | **0.9312** | **19.0656** | **22.9600** | **0.0380** | **8.1298** | **0.9462** | **9.0760** | **4.4688** | **0.9462** | **5.4150** | **0.0000** | **3,831.6239** | **3,831.6239** | **1.1928** | | **3,861.4448** |

## 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 | 0.0833 | 0.0650 | 0.6107 | 1.4800e-003 | 0.1479 | 1.0400e-003 | 0.1489 | 0.0392 | 9.6000e-004 | 0.0402 | | 147.0874 | 147.0874 | 4.6800e-003 | | 147.2045 |
| **Total** | **0.0833** | **0.0650** | **0.6107** | **1.4800e-003** | **0.1479** | **1.0400e-003** | **0.1489** | **0.0392** | **9.6000e-004** | **0.0402** | | **147.0874** | **147.0874** | **4.6800e-003** | | **147.2045** |

# 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 | | | | | 6.6622 | 0.0000 | 6.6622 | 3.3793 | 0.0000 | 3.3793 | | | 0.0000 | | | 0.0000 |
| Off-Road | 5.0901 | 59.5218 | 35.0894 | 0.0620 | | 2.6337 | 2.6337 | | 2.4230 | 2.4230 | | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **5.0901** | **59.5218** | **35.0894** | **0.0620** | **6.6622** | **2.6337** | **9.2959** | **3.3793** | **2.4230** | **5.8024** | | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0926 | 0.0722 | 0.6786 | 1.6400e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 163.4305 | 163.4305 | 5.2000e-003 | | 163.5606 |
| **Total** | **0.0926** | **0.0722** | **0.6786** | **1.6400e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **163.4305** | **163.4305** | **5.2000e-003** | | **163.5606** |

## 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 | | | | | 2.9980 | 0.0000 | 2.9980 | 1.5207 | 0.0000 | 1.5207 | | | 0.0000 | | | 0.0000 |
| Off-Road | 1.5231 | 29.9782 | 36.7226 | 0.0620 | | 1.2994 | 1.2994 | | 1.2994 | 1.2994 | 0.0000 | 6,244.4284 | 6,244.4284 | 1.9440 | | 6,293.0278 |
| **Total** | **1.5231** | **29.9782** | **36.7226** | **0.0620** | **2.9980** | **1.2994** | **4.2974** | **1.5207** | **1.2994** | **2.8201** | **0.0000** | **6,244.4284** | **6,244.4284** | **1.9440** | | **6,293.0278** |

## 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 | 0.0926 | 0.0722 | 0.6786 | 1.6400e-003 | 0.1643 | 1.1500e-003 | 0.1655 | 0.0436 | 1.0600e-003 | 0.0446 | | 163.4305 | 163.4305 | 5.2000e-003 | | 163.5606 |
| **Total** | **0.0926** | **0.0722** | **0.6786** | **1.6400e-003** | **0.1643** | **1.1500e-003** | **0.1655** | **0.0436** | **1.0600e-003** | **0.0446** | | **163.4305** | **163.4305** | **5.2000e-003** | | **163.5606** |

## 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 | 2.6795 | 23.3900 | 17.5804 | 0.0269 | | 1.4999 | 1.4999 | | 1.4099 | 1.4099 | | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **2.6795** | **23.3900** | **17.5804** | **0.0269** | | **1.4999** | **1.4999** | | **1.4099** | **1.4099** | | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

### 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 | 0.1430 | 3.7722 | 0.9284 | 7.7300e-003 | 0.1897 | 0.0272 | 0.2169 | 0.0546 | 0.0260 | 0.0806 | | 814.7570 | 814.7570 | 0.0559 | | 816.1543 |
| Worker | 0.3472 | 0.2707 | 2.5448 | 6.1600e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 612.8643 | 612.8643 | 0.0195 | | 613.3521 |
| **Total** | **0.4902** | **4.0428** | **3.4732** | **0.0139** | **0.8058** | **0.0315** | **0.8373** | **0.2180** | **0.0300** | **0.2480** | | **1,427.6213** | **1,427.6213** | **0.0754** | | **1,429.5064** |

### 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 | 1.0098 | 14.2177 | 18.2359 | 0.0269 | | 0.9149 | 0.9149 | | 0.9149 | 0.9149 | 0.0000 | 2,620.9351 | 2,620.9351 | 0.6421 | | 2,636.9883 |
| **Total** | **1.0098** | **14.2177** | **18.2359** | **0.0269** | | **0.9149** | **0.9149** | | **0.9149** | **0.9149** | **0.0000** | **2,620.9351** | **2,620.9351** | **0.6421** | | **2,636.9883** |

## 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 | 0.1430 | 3.7722 | 0.9284 | 7.7300e-003 | 0.1897 | 0.0272 | 0.2169 | 0.0546 | 0.0260 | 0.0806 | | 814.7570 | 814.7570 | 0.0559 | | 816.1543 |
| Worker | 0.3472 | 0.2707 | 2.5448 | 6.1600e-003 | 0.6161 | 4.3300e-003 | 0.6204 | 0.1634 | 3.9900e-003 | 0.1674 | | 612.8643 | 612.8643 | 0.0195 | | 613.3521 |
| **Total** | **0.4902** | **4.0428** | **3.4732** | **0.0139** | **0.8058** | **0.0315** | **0.8373** | **0.2180** | **0.0300** | **0.2480** | | **1,427.6213** | **1,427.6213** | **0.0754** | | **1,429.5064** |

# 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 | 2.3612 | 21.0788 | 17.1638 | 0.0269 | | 1.2899 | 1.2899 | | 1.2127 | 1.2127 | | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **2.3612** | **21.0788** | **17.1638** | **0.0269** | | **1.2899** | **1.2899** | | **1.2127** | **1.2127** | | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1297 | 3.5776 | 0.8535 | 7.6700e-003 | 0.1897 | 0.0231 | 0.2128 | 0.0546 | 0.0221 | 0.0767 | | 809.0709 | 809.0709 | 0.0534 | | 810.4069 |
| Worker | 0.3134 | 0.2376 | 2.2555 | 5.9800e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 594.9383 | 594.9383 | 0.0172 | | 595.3683 |
| **Total** | **0.4431** | **3.8151** | **3.1090** | **0.0137** | **0.8058** | **0.0273** | **0.8331** | **0.2180** | **0.0260** | **0.2440** | | **1,404.0092** | **1,404.0092** | **0.0706** | | **1,405.7752** |

## 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 | 0.9532 | 14.1600 | 18.1841 | 0.0269 | | 0.9010 | 0.9010 | | 0.9010 | 0.9010 | 0.0000 | 2,591.5802 | 2,591.5802 | 0.6313 | | 2,607.3635 |
| **Total** | **0.9532** | **14.1600** | **18.1841** | **0.0269** | | **0.9010** | **0.9010** | | **0.9010** | **0.9010** | **0.0000** | **2,591.5802** | **2,591.5802** | **0.6313** | | **2,607.3635** |

## 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 | 0.1297 | 3.5776 | 0.8535 | 7.6700e-003 | 0.1897 | 0.0231 | 0.2128 | 0.0546 | 0.0221 | 0.0767 | | 809.0709 | 809.0709 | 0.0534 | | 810.4069 |
| Worker | 0.3134 | 0.2376 | 2.2555 | 5.9800e-003 | 0.6161 | 4.2200e-003 | 0.6203 | 0.1634 | 3.8900e-003 | 0.1673 | | 594.9383 | 594.9383 | 0.0172 | | 595.3683 |
| **Total** | **0.4431** | **3.8151** | **3.1090** | **0.0137** | **0.8058** | **0.0273** | **0.8331** | **0.2180** | **0.0260** | **0.2440** | | **1,404.0092** | **1,404.0092** | **0.0706** | | **1,405.7752** |

# 3.4 Building Construction - 2020

## 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 | 2.1198 | 19.1860 | 16.8485 | 0.0269 | | 1.1171 | 1.1171 | | 1.0503 | 1.0503 | | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **2.1198** | **19.1860** | **16.8485** | **0.0269** | | **1.1171** | **1.1171** | | **1.0503** | **1.0503** | | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1083 | 3.2858 | 0.7650 | 7.6100e-003 | 0.1897 | 0.0154 | 0.2051 | 0.0546 | 0.0147 | 0.0694 | | 803.2435 | 803.2435 | 0.0495 | | 804.4816 |
| Worker | 0.2862 | 0.2100 | 2.0202 | 5.7900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 576.5314 | 576.5314 | 0.0151 | | 576.9076 |
| **Total** | **0.3945** | **3.4958** | **2.7852** | **0.0134** | **0.8058** | **0.0195** | **0.8253** | **0.2181** | **0.0185** | **0.2366** | | **1,379.7748** | **1,379.7748** | **0.0646** | | **1,381.3891** |

## 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 | 0.9101 | 14.1070 | 18.1439 | 0.0269 | | 0.8882 | 0.8882 | | 0.8882 | 0.8882 | 0.0000 | 2,553.0631 | 2,553.0631 | 0.6229 | | 2,568.6345 |
| **Total** | **0.9101** | **14.1070** | **18.1439** | **0.0269** | | **0.8882** | **0.8882** | | **0.8882** | **0.8882** | **0.0000** | **2,553.0631** | **2,553.0631** | **0.6229** | | **2,568.6345** |

## 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 | 0.1083 | 3.2858 | 0.7650 | 7.6100e-003 | 0.1897 | 0.0154 | 0.2051 | 0.0546 | 0.0147 | 0.0694 | | 803.2435 | 803.2435 | 0.0495 | | 804.4816 |
| Worker | 0.2862 | 0.2100 | 2.0202 | 5.7900e-003 | 0.6161 | 4.1100e-003 | 0.6202 | 0.1634 | 3.7900e-003 | 0.1672 | | 576.5314 | 576.5314 | 0.0151 | | 576.9076 |
| **Total** | **0.3945** | **3.4958** | **2.7852** | **0.0134** | **0.8058** | **0.0195** | **0.8253** | **0.2181** | **0.0185** | **0.2366** | | **1,379.7748** | **1,379.7748** | **0.0646** | | **1,381.3891** |

## 3.5 Paving - 2020

### 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 | 1.3566 | 14.0656 | 14.6521 | 0.0228 | | 0.7528 | 0.7528 | | 0.6926 | 0.6926 | | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **1.6530** | **14.0656** | **14.6521** | **0.0228** | | **0.7528** | **0.7528** | | **0.6926** | **0.6926** | | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

### 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

### 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 | 0.5609 | 11.2952 | 17.2957 | 0.0228 | | 0.6093 | 0.6093 | | 0.6093 | 0.6093 | 0.0000 | 2,207.7334 | 2,207.7334 | 0.7140 | | 2,225.5841 |
| Paving | 0.2964 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| **Total** | **0.8574** | **11.2952** | **17.2957** | **0.0228** | | **0.6093** | **0.6093** | | **0.6093** | **0.6093** | **0.0000** | **2,207.7334** | **2,207.7334** | **0.7140** | | **2,225.5841** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

# 3.6 Architectural Coating - 2020

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.2422 | 1.6838 | 1.8314 | 2.9700e-003 | | 0.1109 | 0.1109 | | 0.1109 | 0.1109 | | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.2872** | **1.6838** | **1.8314** | **2.9700e-003** | | **0.1109** | **0.1109** | | **0.1109** | **0.1109** | | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

## 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 | 60.0450 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Off-Road | 0.0594 | 1.3570 | 1.8324 | 2.9700e-003 | | 0.0951 | 0.0951 | | 0.0951 | 0.0951 | 0.0000 | 281.4481 | 281.4481 | 0.0218 | | 281.9928 |
| **Total** | **60.1044** | **1.3570** | **1.8324** | **2.9700e-003** | | **0.0951** | **0.0951** | | **0.0951** | **0.0951** | **0.0000** | **281.4481** | **281.4481** | **0.0218** | | **281.9928** |

## 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 | 0.0572 | 0.0420 | 0.4040 | 1.1600e-003 | 0.1232 | 8.2000e-004 | 0.1240 | 0.0327 | 7.6000e-004 | 0.0334 | | 115.3063 | 115.3063 | 3.0100e-003 | | 115.3815 |
| **Total** | **0.0572** | **0.0420** | **0.4040** | **1.1600e-003** | **0.1232** | **8.2000e-004** | **0.1240** | **0.0327** | **7.6000e-004** | **0.0334** | | **115.3063** | **115.3063** | **3.0100e-003** | | **115.3815** |

# 4.0 Operational Detail - Mobile

## 4.1 Mitigation Measures Mobile

Improve Pedestrian Network

| | 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 | 0.6732 | 4.3999 | 7.7877 | 0.0246 | 1.8984 | 0.0303 | 1.9286 | 0.5087 | 0.0286 | 0.5373 | | 2,494.6671 | 2,494.6671 | 0.1207 | | 2,497.6837 |
| Unmitigated | 0.6782 | 4.4475 | 7.8951 | 0.0251 | 1.9371 | 0.0308 | 1.9679 | 0.5191 | 0.0291 | 0.5482 | | 2,540.7413 | 2,540.7413 | 0.1220 | | 2,543.7912 |

## 4.2 Trip Summary Information

| | Average Daily Trip Rate | | | Unmitigated | Mitigated |
|---|---|---|---|---|---|
| Land Use | Weekday | Saturday | Sunday | Annual VMT | Annual VMT |
| Other Asphalt Surfaces | 0.00 | 0.00 | 0.00 | | |
| Single Family Housing | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |
| Total | 368.16 | 393.12 | 393.12 | 866,776 | 849,440 |

## 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- | H-S or C-C | H-O or C-NW | Primary | Diverted | Pass-by |
| Other Asphalt Surfaces | 9.50 | 7.30 | 7.30 | 0.00 | 0.00 | 0.00 | 0 | 0 | 0 |
| Single Family Housing | 10.80 | 4.80 | 5.70 | 31.00 | 15.00 | 54.00 | 86 | 11 | 3 |

## 4.4 Fleet Mix

| Land Use | LDA | LDT1 | LDT2 | MDV | LHD1 | LHD2 | MHD | HHD | OBUS | UBUS | MCY | SBUS | MH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Other Asphalt Surfaces | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |
| Single Family Housing | 0.558186 | 0.040947 | 0.190770 | 0.110456 | 0.017401 | 0.005228 | 0.022658 | 0.042795 | 0.002118 | 0.002805 | 0.005569 | 0.000308 | 0.000759 |

# 5.0 Energy Detail

Historical Energy Use: N

## 5.1 Mitigation Measures Energy

| | 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 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| NaturalGas Unmitigated | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |

## 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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3105.58 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

**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 | | | | | |
| Other Asphalt Surfaces | 0 | 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 |
| Single Family Housing | 3.10558 | 0.0335 | 0.2862 | 0.1218 | 1.8300e-003 | | 0.0231 | 0.0231 | | 0.0231 | 0.0231 | | 365.3629 | 365.3629 | 7.0000e-003 | 6.7000e-003 | 367.5341 |
| **Total** | | **0.0335** | **0.2862** | **0.1218** | **1.8300e-003** | | **0.0231** | **0.0231** | | **0.0231** | **0.0231** | | **365.3629** | **365.3629** | **7.0000e-003** | **6.7000e-003** | **367.5341** |

# 6.0 Area Detail

## 6.1 Mitigation Measures Area

Use Electric Lawnmower

Use Electric Leafblower

Use Electric Chainsaw

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use only Natural Gas Hearths

| | 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 | 3.8489 | 0.2258 | 3.2856 | 1.3700e-003 | | 0.0329 | 0.0329 | | 0.0329 | 0.0329 | 0.0000 | 246.6244 | 246.6244 | 0.0102 | 4.4200e-003 | 248.1951 |
| Unmitigated | 4.8071 | 0.3678 | 11.9980 | 0.0297 | | 1.4505 | 1.4505 | | 1.4505 | 1.4505 | 209.2203 | 246.6766 | 455.8969 | 0.9883 | 4.4200e-003 | 481.9212 |

## 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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.9789 | 0.3304 | 8.7695 | 0.0296 | | 1.4327 | 1.4327 | | 1.4327 | 1.4327 | 209.2203 | 240.8824 | 450.1026 | 0.9827 | 4.4200e-003 | 475.9856 |
| Landscaping | 0.0983 | 0.0373 | 3.2286 | 1.7000e-004 | | 0.0178 | 0.0178 | | 0.0178 | 0.0178 | | 5.7943 | 5.7943 | 5.6500e-003 | | 5.9356 |
| **Total** | **4.8071** | **0.3678** | **11.9981** | **0.0297** | | **1.4505** | **1.4505** | | **1.4505** | **1.4505** | **209.2203** | **246.6766** | **455.8969** | **0.9883** | **4.4200e-003** | **481.9212** |

**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 | 0.5758 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Consumer Products | 3.1541 | | | | | 0.0000 | 0.0000 | | 0.0000 | 0.0000 | | | 0.0000 | | | 0.0000 |
| Hearth | 0.0221 | 0.1887 | 0.0803 | 1.2000e-003 | | 0.0153 | 0.0153 | | 0.0153 | 0.0153 | 0.0000 | 240.8824 | 240.8824 | 4.6200e-003 | 4.4200e-003 | 242.3138 |
| Landscaping | 0.0969 | 0.0371 | 3.2053 | 1.7000e-004 | | 0.0176 | 0.0176 | | 0.0176 | 0.0176 | | 5.7421 | 5.7421 | 5.5700e-003 | | 5.8813 |
| **Total** | **3.8489** | **0.2258** | **3.2856** | **1.3700e-003** | | **0.0329** | **0.0329** | | **0.0329** | **0.0329** | **0.0000** | **246.6244** | **246.6244** | **0.0102** | **4.4200e-003** | **248.1951** |

# 7.0 Water Detail

## 7.1 Mitigation Measures Water

# 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

## Spotorno Ranch

**No Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

| **Construction Scheduling** | **2018** | | |
|---|---|---|---|
| | 8 | hours/day | |
| | 5 | days/week | |
| | 13 | weeks/year | *start from 10/1/2018 |
| | 520 | hours/year | |

**Onsite Construction Area Source Size (m2):** 130146.8 from AERMOD

**Onsite Construction PM2.5 Emissions**

| **2018** | **Construction Activity** | **Onsite Annual DPM Exhaust Emissions (tons/year)** | **Onsite Annual DPM Exhaust Emissions (g/sec)** | **Onsite DPM Source Exhaust Emissions (g/m2-sec)** |
|---|---|---|---|---|
| | Site Preparation | 2.370E-02 | 1.150E-02 | 8.833E-08 |
| | Grading | 5.450E-02 | 2.643E-02 | 2.031E-07 |
| | Building Construction | 7.000E-04 | 3.395E-04 | 2.609E-09 |
| | | | | |
| | **Total** | **7.890E-02** | **3.827E-02** | **2.941E-07** |

**Offsite Construction Vehicle PM2.5 Emissions**

| **2018** | **Construction Activity** | **Offsite Hauling Annual DPM Exhaust Emissions (tons/year)** | **Offsite Vendor Annual DPM Exhaust Emissions (tons/year)** | **Offsite Workers Annual DPM Exhaust Emissions (tons/year)** | |
|---|---|---|---|---|---|
| | Site Preparation | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | Grading | 0.000E+00 | 0.000E+00 | 2.000E-05 | |
| | Building Construction | 0.000E+00 | 1.000E-05 | 0.000E+00 | |
| | 0 | | | | |
| | **Total (tons/year)** | **0.000E+00** | **1.000E-05** | **3.000E-05** | **4.000E-05** |
| | **Trip Distance assumed in CalEEMod (mi)** | 20.0 | 7.3 | 10.8 | |
| | **Offsite Project Trip Distance Along Roadway Segment** Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions Along Roadway Segment** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **7.344E-07** | **1.489E-06** | |

| **Offsite Emissions Along Roadway Segment Analyzed** | |
|---|---|
| **Total Offsite Project Exhaust Emissions (tons/year)** | **2.224E-06** |
| **Total Offsite Project Exhaust Emissions (grams/sec)** | **1.079E-06** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **7.890E-02** |
| **Total Onsite Emissions (tons/year)** | **7.890E-02** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **2.941E-07** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 7.890E-02 |

## Spotorno Ranch

**No Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

| **Construction Scheduling** | **2019** | |
|---|---|---|
| | 8 | hours/day |
| | 5 | days/week |
| | 52 | weeks/year |
| | 2080 | hours/year |

**Onsite Construction Area Source Size (m2):** 130146.80

**Onsite Construction PM2.5 Emissions**

| **2019** | | **Onsite** | **Onsite** | **Onsite DPM** |
|---|---|---|---|---|
| | **Construction Activity** | **Annual DPM** | **Annual DPM** | **Source Exhaust** |
| | | **Exhaust Emissions** | **Exhaust Emissions** | **Emissions** |
| | | **(tons/year)** | **(g/sec)** | **(g/m2-sec)** |
| | Building Construction | 1.583E-01 | 1.920E-02 | 1.475E-07 |
| | | | | |
| | | | | |
| | **Total** | **1.583E-01** | **1.920E-02** | **1.475E-07** |

**Offsite Construction Vehicle PM2.5 Emissions**

| **2019** | | **Offsite Hauling** | **Offsite Vendor** | **Offsite Workers** | |
|---|---|---|---|---|---|
| | | **Annual DPM** | **Annual DPM** | **Annual DPM** | |
| | **Construction Activity** | **Exhaust Emissions** | **Exhaust Emissions** | **Exhaust Emissions** | |
| | | **(tons/year)** | **(tons/year)** | **(tons/year)** | |
| | Building Construction | 0.000E+00 | 2.860E-03 | 5.100E-04 | |
| | 0 | | | | |
| | 0 | | | | |
| | **Total (tons/year)** | **0.000E+00** | **2.860E-03** | **5.100E-04** | **3.370E-03** |
| | Trip Distance assumed in CalEEMod (mi) | 20.0 | 7.3 | 10.8 | |
| | Offsite Project Trip Distance Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **2.100E-04** | **2.532E-05** | |

| | |
|---|---|
| **Emissions Along Roadway Segment** | |
| **Offsite Project Exhaust Emissions (tons/year)** | **2.354E-04** |
| **Offsite Project Exhaust Emissions (grams/sec)** | **2.854E-05** |
| | |
| **Offsite Project Fugitive Emissions (tons/year)** | **0.000E+00** |
| **Offsite Project Fugitive Emissions (grams/sec)** | **0.000E+00** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **1.583E-01** |
| **Total Onsite Emissions (tons/year)** | **1.583E-01** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **1.475E-07** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 1.585E-01 |
| **Total PM2.5 (tons/year)** | **1.585E-01** |

## Spotorno Ranch

**No Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Construction Scheduling** **2020**

8 hours/day
5 days/week **end at December 11, 2020
50 weeks/year
2000 hours/year

**Onsite Construction Area Source Size (m2):** 130146.80

**Onsite Construction PM2.5 Emissions**

| 2020 | Construction Activity | Onsite Annual DPM Exhaust Emissions (tons/year) | Onsite Annual DPM Exhaust Emissions (g/sec) | Onsite DPM Source Exhaust Emissions (g/m2-sec) |
|---|---|---|---|---|
| | Building Construction | 9.350E-02 | 1.179E-02 | 9.060E-08 |
| | Paving | 1.210E-02 | 1.526E-03 | 1.172E-08 |
| | Architectural Coating | 1.940E-03 | 2.447E-04 | 1.880E-09 |
| | **Total** | **1.075E-01** | **1.356E-02** | **1.042E-07** |

**Offsite Construction Vehicle PM2.5 Emissions**

| 2020 | Construction Activity | Offsite Hauling Annual DPM Exhaust Emissions (tons/year) | Offsite Vendor Annual DPM Exhaust Emissions (tons/year) | Offsite Workers Annual DPM Exhaust Emissions (tons/year) | |
|---|---|---|---|---|---|
| | Building Construction | 0.000E+00 | 1.300E-03 | 3.400E-04 | |
| | Paving | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | Architectural Coating | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | **Total (tons/year)** | **0.000E+00** | **1.300E-03** | **3.600E-04** | **1.660E-03** |
| | Trip Distance assumed in CalEEMod (mi) | 20.0 | 7.3 | 10.8 | |
| | Offsite Project Trip Distance Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **9.547E-05** | **1.787E-05** | |

| | |
|---|---|
| **Emissions Along Roadway Segment** | |
| **Offsite Project Exhaust Emissions (tons/year)** | **1.133E-04** |
| **Offsite Project Exhaust Emissions (grams/sec)** | **1.429E-05** |
| **Offsite Project Fugitive Emissions (tons/year)** | **0.000E+00** |
| **Offsite Project Fugitive Emissions (grams/sec)** | **0.000E+00** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **1.075E-01** |
| **Total Onsite Emissions (tons/year)** | **1.075E-01** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **1.042E-07** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 1.077E-01 |
| **Total PM2.5 (tons/year)** | **1.077E-01** |

## Spotorno Ranch

**2018** **No Mitigation** **At Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 2.94052E-07
**Annual Average Offsite DPM Exhaust Emission Rate:** 1.07853E-06

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.06626 | 0.00001 | 1.07853E-06 | 0.06626 |
| 599733.16 | 4165874.92 | 1.51441 | 0.04453 | 0.00001 | 1.07853E-06 | 0.04453 |
| 599741.25 | 4165874.65 | 1.55224 | 0.04564 | 0.00001 | 1.07853E-06 | 0.04564 |
| 599741.25 | 4165858.74 | 1.25501 | 0.03690 | 0.00001 | 1.07853E-06 | 0.03690 |
| 599743.41 | 4165868.72 | 1.43625 | 0.04223 | 0.00001 | 1.07853E-06 | 0.04223 |
| 599699.19 | 4165884.9 | 1.51426 | 0.04453 | 0.00001 | 1.07853E-06 | 0.04453 |
| 599688.4 | 4165885.17 | 1.45014 | 0.04264 | 0.00001 | 1.07853E-06 | 0.04264 |
| 599674.38 | 4165884.36 | 1.37101 | 0.04031 | 0.00001 | 1.07853E-06 | 0.04032 |
| 599679.23 | 4165849.84 | 0.97833 | 0.02877 | 0.00001 | 1.07853E-06 | 0.02877 |
| 599688.13 | 4165850.38 | 0.99875 | 0.02937 | 0.00001 | 1.07853E-06 | 0.02937 |
| 599735.05 | 4165820.18 | 0.86321 | 0.02538 | 0.00001 | 1.07853E-06 | 0.02538 |
| 599730.2 | 4165813.44 | 0.8139 | 0.02393 | 0.00001 | 1.07853E-06 | 0.02393 |
| 599727.23 | 4165806.7 | 0.77342 | 0.02274 | 0.00001 | 1.07853E-06 | 0.02274 |
| 599700.27 | 4165802.66 | 0.71926 | 0.02115 | 0.00001 | 1.07853E-06 | 0.02115 |
| 599633.92 | 4165882.15 | 1.18771 | 0.03492 | 0.00001 | 1.07853E-06 | 0.03493 |
| 599610.98 | 4165795.75 | 0.60994 | 0.01794 | 0.00002 | 2.15706E-06 | 0.01794 |
| 599618.85 | 4165755 | 0.49706 | 0.01462 | 0.00002 | 2.15706E-06 | 0.01462 |
| 599633.15 | 4165749.99 | 0.49351 | 0.01451 | 0.00002 | 2.15706E-06 | 0.01451 |
| 599734.53 | 4165764.17 | 0.61664 | 0.01813 | 0.00002 | 2.15706E-06 | 0.01813 |
| 599721.84 | 4165775.36 | 0.63843 | 0.01877 | 0.00002 | 2.15706E-06 | 0.01878 |
| 599731.91 | 4165723.49 | 0.49603 | 0.01459 | 0.00003 | 3.23559E-06 | 0.01459 |
| 599589.04 | 4166098.06 | 0.43435 | 0.01277 | 0.00000 | 0.00000E+00 | 0.01277 |
| 599589.04 | 4166077.92 | 0.62239 | 0.01830 | 0.00000 | 0.00000E+00 | 0.01830 |
| 599561.14 | 4166065 | 0.53365 | 0.01569 | 0.00000 | 0.00000E+00 | 0.01569 |
| 599693.38 | 4166143.01 | 0.99863 | 0.02936 | 0.00000 | 0.00000E+00 | 0.02936 |
| 599756.4 | 4166195.69 | 0.71013 | 0.02088 | 0.00000 | 0.00000E+00 | 0.02088 |
| 599715.6 | 4166214.81 | 0.42038 | 0.01236 | 0.00000 | 0.00000E+00 | 0.01236 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00460 | 0.00000 | 0.00000E+00 | 0.00460 |
| 599813.42 | 4166193.21 | 0.95887 | 0.02820 | 0.00000 | 0.00000E+00 | 0.02820 |
| 599855.57 | 4166198.04 | 1.02919 | 0.03026 | 0.00000 | 0.00000E+00 | 0.03026 |
| 599993.73 | 4166279.68 | 0.52742 | 0.01551 | 0.00000 | 0.00000E+00 | 0.01551 |
| 599986.85 | 4166279.22 | 0.5276 | 0.01551 | 0.00000 | 0.00000E+00 | 0.01551 |
| 599994.19 | 4166267.07 | 0.58263 | 0.01713 | 0.00000 | 0.00000E+00 | 0.01713 |
| 599805.61 | 4166278.22 | 0.38684 | 0.01138 | 0.00000 | 0.00000E+00 | 0.01138 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00395 | 0.00000 | 0.00000E+00 | 0.00395 |
| 599693 | 4166325.23 | 0.16162 | 0.00475 | 0.00000 | 0.00000E+00 | 0.00475 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00417 | 0.00000 | 0.00000E+00 | 0.00417 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00472 | 0.00000 | 0.00000E+00 | 0.00472 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00561 | 0.00000 | 0.00000E+00 | 0.00561 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00615 | 0.00000 | 0.00000E+00 | 0.00615 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00341 | 0.00000 | 0.00000E+00 | 0.00341 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00562 | 0.00000 | 0.00000E+00 | 0.00562 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00783 | 0.00000 | 0.00000E+00 | 0.00783 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00906 | 0.00000 | 0.00000E+00 | 0.00906 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00196 | 0.00000 | 0.00000E+00 | 0.00196 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00275 | 0.00000 | 0.00000E+00 | 0.00275 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00315 | 0.00000 | 0.00000E+00 | 0.00315 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00279 | 0.00000 | 0.00000E+00 | 0.00279 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00179 | 0.00000 | 0.00000E+00 | 0.00179 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00225 | 0.00000 | 0.00000E+00 | 0.00225 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00251 | 0.00000 | 0.00000E+00 | 0.00251 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00238 | 0.00000 | 0.00000E+00 | 0.00238 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00172 | 0.00000 | 0.00000E+00 | 0.00172 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00196 | 0.00000 | 0.00000E+00 | 0.00196 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00153 | 0.00000 | 0.00000E+00 | 0.00153 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00222 | 0.00000 | 0.00000E+00 | 0.00222 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00214 | 0.00000 | 0.00000E+00 | 0.00214 |
| 600138.3 | 4165809.31 | 2.45723 | 0.07226 | 0.00001 | 1.07853E-06 | 0.07226 |
| 600116.85 | 4165800.73 | 2.39714 | 0.07049 | 0.00002 | 2.15706E-06 | 0.07049 |
| 600084.67 | 4165785 | 2.09007 | 0.06146 | 0.00004 | 4.31412E-06 | 0.06146 |
| 600042.49 | 4165762.11 | 1.48036 | 0.04353 | 0.00007 | 7.54970E-06 | 0.04354 |
| 600006.02 | 4165743.52 | 0.91417 | 0.02688 | 0.00008 | 8.62823E-06 | 0.02689 |
| 599955.96 | 4165699.9 | 0.50206 | 0.01476 | 0.00005 | 5.39265E-06 | 0.01477 |
| 599899.58 | 4165667.19 | 0.37379 | 0.01099 | 0.00005 | 5.39265E-06 | 0.01100 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00722 | 0.00003 | 3.23559E-06 | 0.00722 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00689 | 0.00004 | 4.31412E-06 | 0.00689 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00447 | 0.00001 | 1.07853E-06 | 0.00447 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00772 | 0.00011 | 1.18638E-05 | 0.00773 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00673 | 0.00004 | 4.31412E-06 | 0.00674 |
| 600423.04 | 4165950.07 | 0.99324 | 0.02921 | 0.00000 | 0.00000E+00 | 0.02921 |
| 600450.99 | 4165951.23 | 0.84523 | 0.02485 | 0.00000 | 0.00000E+00 | 0.02485 |
| 600482.43 | 4165952.4 | 0.71015 | 0.02088 | 0.00000 | 0.00000E+00 | 0.02088 |
| 600513.87 | 4165944.25 | 0.60232 | 0.01771 | 0.00000 | 0.00000E+00 | 0.01771 |
| 600538.32 | 4165900 | 0.54825 | 0.01612 | 0.00000 | 0.00000E+00 | 0.01612 |
| 600535.99 | 4165872.05 | 0.56223 | 0.01653 | 0.00000 | 0.00000E+00 | 0.01653 |
| 600477.77 | 4165819.66 | 0.65837 | 0.01936 | 0.00000 | 0.00000E+00 | 0.01936 |
| 600395.1 | 4165790.55 | 0.77024 | 0.02265 | 0.00000 | 0.00000E+00 | 0.02265 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00838 | 0.00000 | 0.00000E+00 | 0.00838 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00555 | 0.00000 | 0.00000E+00 | 0.00555 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00425 | 0.00000 | 0.00000E+00 | 0.00425 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00317 | 0.00001 | 1.07853E-06 | 0.00317 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00274 | 0.00001 | 1.07853E-06 | 0.00274 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00219 | 0.00000 | 0.00000E+00 | 0.00219 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00183 | 0.00000 | 0.00000E+00 | 0.00183 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00149 | 0.00000 | 0.00000E+00 | 0.00149 |
| 599480.55 | 4165898.91 | 0.61514 | 0.01809 | 0.00001 | 1.07853E-06 | 0.01809 |
| 599529.46 | 4165748.7 | 0.42305 | 0.01244 | 0.00005 | 5.39265E-06 | 0.01245 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00568 | 0.00001 | 1.07853E-06 | 0.00569 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

**Spotorno Ranch** **2019** **No Mitigation** **at Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 1.47492E-07 grams/m2/sec

**Annual Average Offsite DPM Exhaust Emission Rate:** 2.85390E-05 grams/sec

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.03323 | 0.00001 | 2.85390E-05 | 0.03326 |
| 599733.16 | 4165874.92 | 1.51441 | 0.02234 | 0.00001 | 2.85390E-05 | 0.02236 |
| 599741.25 | 4165874.65 | 1.55224 | 0.02289 | 0.00001 | 2.85390E-05 | 0.02292 |
| 599741.25 | 4165858.74 | 1.25501 | 0.01851 | 0.00001 | 2.85390E-05 | 0.01854 |
| 599743.41 | 4165868.72 | 1.43625 | 0.02118 | 0.00001 | 2.85390E-05 | 0.02121 |
| 599699.19 | 4165884.9 | 1.51426 | 0.02233 | 0.00001 | 2.85390E-05 | 0.02236 |
| 599688.4 | 4165885.17 | 1.45014 | 0.02139 | 0.00001 | 2.85390E-05 | 0.02142 |
| 599674.38 | 4165884.36 | 1.37101 | 0.02022 | 0.00001 | 2.85390E-05 | 0.02025 |
| 599679.23 | 4165849.84 | 0.97833 | 0.01443 | 0.00001 | 2.85390E-05 | 0.01446 |
| 599688.13 | 4165850.38 | 0.99875 | 0.01473 | 0.00001 | 2.85390E-05 | 0.01476 |
| 599735.05 | 4165820.18 | 0.86321 | 0.01273 | 0.00001 | 2.85390E-05 | 0.01276 |
| 599730.2 | 4165813.44 | 0.8139 | 0.01200 | 0.00001 | 2.85390E-05 | 0.01203 |
| 599727.23 | 4165806.7 | 0.77342 | 0.01141 | 0.00001 | 2.85390E-05 | 0.01144 |
| 599700.27 | 4165802.66 | 0.71926 | 0.01061 | 0.00001 | 2.85390E-05 | 0.01064 |
| 599633.92 | 4165882.15 | 1.18771 | 0.01752 | 0.00001 | 2.85390E-05 | 0.01755 |
| 599610.98 | 4165795.75 | 0.60994 | 0.00900 | 0.00002 | 5.70779E-05 | 0.00905 |
| 599618.85 | 4165755 | 0.49706 | 0.00733 | 0.00002 | 5.70779E-05 | 0.00739 |
| 599633.15 | 4165749.99 | 0.49351 | 0.00728 | 0.00002 | 5.70779E-05 | 0.00734 |
| 599734.53 | 4165764.17 | 0.61664 | 0.00909 | 0.00002 | 5.70779E-05 | 0.00915 |
| 599721.84 | 4165775.36 | 0.63843 | 0.00942 | 0.00002 | 5.70779E-05 | 0.00947 |
| 599731.91 | 4165723.49 | 0.49603 | 0.00732 | 0.00003 | 8.56169E-05 | 0.00740 |
| 599589.04 | 4166098.06 | 0.43435 | 0.00641 | 0.00000 | 0.00000E+00 | 0.00641 |
| 599589.04 | 4166077.92 | 0.62239 | 0.00918 | 0.00000 | 0.00000E+00 | 0.00918 |
| 599561.14 | 4166065 | 0.53365 | 0.00787 | 0.00000 | 0.00000E+00 | 0.00787 |
| 599693.38 | 4166143.01 | 0.99863 | 0.01473 | 0.00000 | 0.00000E+00 | 0.01473 |
| 599756.4 | 4166195.69 | 0.71013 | 0.01047 | 0.00000 | 0.00000E+00 | 0.01047 |
| 599715.6 | 4166214.81 | 0.42038 | 0.00620 | 0.00000 | 0.00000E+00 | 0.00620 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00231 | 0.00000 | 0.00000E+00 | 0.00231 |
| 599813.42 | 4166193.21 | 0.95887 | 0.01414 | 0.00000 | 0.00000E+00 | 0.01414 |
| 599855.57 | 4166198.04 | 1.02919 | 0.01518 | 0.00000 | 0.00000E+00 | 0.01518 |
| 599993.73 | 4166279.68 | 0.52742 | 0.00778 | 0.00000 | 0.00000E+00 | 0.00778 |
| 599986.85 | 4166279.22 | 0.5276 | 0.00778 | 0.00000 | 0.00000E+00 | 0.00778 |
| 599994.19 | 4166267.07 | 0.58263 | 0.00859 | 0.00000 | 0.00000E+00 | 0.00859 |
| 599805.61 | 4166278.22 | 0.38684 | 0.00571 | 0.00000 | 0.00000E+00 | 0.00571 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00198 | 0.00000 | 0.00000E+00 | 0.00198 |
| 599693 | 4166325.23 | 0.16162 | 0.00238 | 0.00000 | 0.00000E+00 | 0.00238 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00209 | 0.00000 | 0.00000E+00 | 0.00209 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00237 | 0.00000 | 0.00000E+00 | 0.00237 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00281 | 0.00000 | 0.00000E+00 | 0.00281 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00309 | 0.00000 | 0.00000E+00 | 0.00309 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00171 | 0.00000 | 0.00000E+00 | 0.00171 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00282 | 0.00000 | 0.00000E+00 | 0.00282 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00393 | 0.00000 | 0.00000E+00 | 0.00393 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00454 | 0.00000 | 0.00000E+00 | 0.00454 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00098 | 0.00000 | 0.00000E+00 | 0.00098 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00138 | 0.00000 | 0.00000E+00 | 0.00138 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00158 | 0.00000 | 0.00000E+00 | 0.00158 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00140 | 0.00000 | 0.00000E+00 | 0.00140 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00090 | 0.00000 | 0.00000E+00 | 0.00090 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00113 | 0.00000 | 0.00000E+00 | 0.00113 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00126 | 0.00000 | 0.00000E+00 | 0.00126 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00119 | 0.00000 | 0.00000E+00 | 0.00119 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00086 | 0.00000 | 0.00000E+00 | 0.00086 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00098 | 0.00000 | 0.00000E+00 | 0.00098 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00077 | 0.00000 | 0.00000E+00 | 0.00077 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00111 | 0.00000 | 0.00000E+00 | 0.00111 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00107 | 0.00000 | 0.00000E+00 | 0.00107 |
| 600138.3 | 4165809.31 | 2.45723 | 0.03624 | 0.00001 | 2.85390E-05 | 0.03627 |
| 600116.85 | 4165800.73 | 2.39714 | 0.03536 | 0.00002 | 5.70779E-05 | 0.03541 |
| 600084.67 | 4165785 | 2.09007 | 0.03083 | 0.00004 | 1.14156E-04 | 0.03094 |
| 600042.49 | 4165762.11 | 1.48036 | 0.02183 | 0.00007 | 1.99773E-04 | 0.02203 |
| 600006.02 | 4165743.52 | 0.91417 | 0.01348 | 0.00008 | 2.28312E-04 | 0.01371 |
| 599955.96 | 4165699.9 | 0.50206 | 0.00740 | 0.00005 | 1.42695E-04 | 0.00755 |
| 599899.58 | 4165667.19 | 0.37379 | 0.00551 | 0.00005 | 1.42695E-04 | 0.00566 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00362 | 0.00003 | 8.56169E-05 | 0.00370 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00346 | 0.00004 | 1.14156E-04 | 0.00357 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00224 | 0.00001 | 2.85390E-05 | 0.00227 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00387 | 0.00011 | 3.13929E-04 | 0.00419 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00338 | 0.00004 | 1.14156E-04 | 0.00349 |
| 600423.04 | 4165950.07 | 0.99324 | 0.01465 | 0.00000 | 0.00000E+00 | 0.01465 |
| 600450.99 | 4165951.23 | 0.84523 | 0.01247 | 0.00000 | 0.00000E+00 | 0.01247 |
| 600482.43 | 4165952.4 | 0.71015 | 0.01047 | 0.00000 | 0.00000E+00 | 0.01047 |
| 600513.87 | 4165944.25 | 0.60232 | 0.00888 | 0.00000 | 0.00000E+00 | 0.00888 |
| 600538.32 | 4165900 | 0.54825 | 0.00809 | 0.00000 | 0.00000E+00 | 0.00809 |
| 600535.99 | 4165872.05 | 0.56223 | 0.00829 | 0.00000 | 0.00000E+00 | 0.00829 |
| 600477.77 | 4165819.66 | 0.65837 | 0.00971 | 0.00000 | 0.00000E+00 | 0.00971 |
| 600395.1 | 4165790.55 | 0.77024 | 0.01136 | 0.00000 | 0.00000E+00 | 0.01136 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00420 | 0.00000 | 0.00000E+00 | 0.00420 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00278 | 0.00000 | 0.00000E+00 | 0.00278 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00213 | 0.00000 | 0.00000E+00 | 0.00213 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00159 | 0.00001 | 2.85390E-05 | 0.00162 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00137 | 0.00001 | 2.85390E-05 | 0.00140 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00110 | 0.00000 | 0.00000E+00 | 0.00110 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00092 | 0.00000 | 0.00000E+00 | 0.00092 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00075 | 0.00000 | 0.00000E+00 | 0.00075 |
| 599480.55 | 4165898.91 | 0.61514 | 0.00907 | 0.00001 | 2.85390E-05 | 0.00910 |
| 599529.46 | 4165748.7 | 0.42305 | 0.00624 | 0.00005 | 1.42695E-04 | 0.00638 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00285 | 0.00001 | 2.85390E-05 | 0.00288 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

**Spotorno Ranch** **2020** **No Mitigation** **at Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 1.04205E-07 grams/m2/sec

**Annual Average Offsite DPM Exhaust Emission Rate:** 1.42936E-05 grams/sec

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.02348 | 0.00001 | 1.42936E-05 | 0.02349 |
| 599733.16 | 4165874.92 | 1.51441 | 0.01578 | 0.00001 | 1.42936E-05 | 0.01580 |
| 599741.25 | 4165874.65 | 1.55224 | 0.01618 | 0.00001 | 1.42936E-05 | 0.01619 |
| 599741.25 | 4165858.74 | 1.25501 | 0.01308 | 0.00001 | 1.42936E-05 | 0.01309 |
| 599743.41 | 4165868.72 | 1.43625 | 0.01497 | 0.00001 | 1.42936E-05 | 0.01498 |
| 599699.19 | 4165884.9 | 1.51426 | 0.01578 | 0.00001 | 1.42936E-05 | 0.01579 |
| 599688.4 | 4165885.17 | 1.45014 | 0.01511 | 0.00001 | 1.42936E-05 | 0.01513 |
| 599674.38 | 4165884.36 | 1.37101 | 0.01429 | 0.00001 | 1.42936E-05 | 0.01430 |
| 599679.23 | 4165849.84 | 0.97833 | 0.01019 | 0.00001 | 1.42936E-05 | 0.01021 |
| 599688.13 | 4165850.38 | 0.99875 | 0.01041 | 0.00001 | 1.42936E-05 | 0.01042 |
| 599735.05 | 4165820.18 | 0.86321 | 0.00900 | 0.00001 | 1.42936E-05 | 0.00901 |
| 599730.2 | 4165813.44 | 0.8139 | 0.00848 | 0.00001 | 1.42936E-05 | 0.00850 |
| 599727.23 | 4165806.7 | 0.77342 | 0.00806 | 0.00001 | 1.42936E-05 | 0.00807 |
| 599700.27 | 4165802.66 | 0.71926 | 0.00750 | 0.00001 | 1.42936E-05 | 0.00751 |
| 599633.92 | 4165882.15 | 1.18771 | 0.01238 | 0.00001 | 1.42936E-05 | 0.01239 |
| 599610.98 | 4165795.75 | 0.60994 | 0.00636 | 0.00002 | 2.85872E-05 | 0.00638 |
| 599618.85 | 4165755 | 0.49706 | 0.00518 | 0.00002 | 2.85872E-05 | 0.00521 |
| 599633.15 | 4165749.99 | 0.49351 | 0.00514 | 0.00002 | 2.85872E-05 | 0.00517 |
| 599734.53 | 4165764.17 | 0.61664 | 0.00643 | 0.00002 | 2.85872E-05 | 0.00645 |
| 599721.84 | 4165775.36 | 0.63843 | 0.00665 | 0.00002 | 2.85872E-05 | 0.00668 |
| 599731.91 | 4165723.49 | 0.49603 | 0.00517 | 0.00003 | 4.28807E-05 | 0.00521 |
| 599589.04 | 4166098.06 | 0.43435 | 0.00453 | 0.00000 | 0.00000E+00 | 0.00453 |
| 599589.04 | 4166077.92 | 0.62239 | 0.00649 | 0.00000 | 0.00000E+00 | 0.00649 |
| 599561.14 | 4166065 | 0.53365 | 0.00556 | 0.00000 | 0.00000E+00 | 0.00556 |
| 599693.38 | 4166143.01 | 0.99863 | 0.01041 | 0.00000 | 0.00000E+00 | 0.01041 |
| 599756.4 | 4166195.69 | 0.71013 | 0.00740 | 0.00000 | 0.00000E+00 | 0.00740 |
| 599715.6 | 4166214.81 | 0.42038 | 0.00438 | 0.00000 | 0.00000E+00 | 0.00438 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00163 | 0.00000 | 0.00000E+00 | 0.00163 |
| 599813.42 | 4166193.21 | 0.95887 | 0.00999 | 0.00000 | 0.00000E+00 | 0.00999 |
| 599855.57 | 4166198.04 | 1.02919 | 0.01072 | 0.00000 | 0.00000E+00 | 0.01072 |
| 599993.73 | 4166279.68 | 0.52742 | 0.00550 | 0.00000 | 0.00000E+00 | 0.00550 |
| 599986.85 | 4166279.22 | 0.5276 | 0.00550 | 0.00000 | 0.00000E+00 | 0.00550 |
| 599994.19 | 4166267.07 | 0.58263 | 0.00607 | 0.00000 | 0.00000E+00 | 0.00607 |
| 599805.61 | 4166278.22 | 0.38684 | 0.00403 | 0.00000 | 0.00000E+00 | 0.00403 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00140 | 0.00000 | 0.00000E+00 | 0.00140 |
| 599693 | 4166325.23 | 0.16162 | 0.00168 | 0.00000 | 0.00000E+00 | 0.00168 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00148 | 0.00000 | 0.00000E+00 | 0.00148 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00167 | 0.00000 | 0.00000E+00 | 0.00167 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00199 | 0.00000 | 0.00000E+00 | 0.00199 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00218 | 0.00000 | 0.00000E+00 | 0.00218 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00121 | 0.00000 | 0.00000E+00 | 0.00121 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00199 | 0.00000 | 0.00000E+00 | 0.00199 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00278 | 0.00000 | 0.00000E+00 | 0.00278 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00321 | 0.00000 | 0.00000E+00 | 0.00321 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00070 | 0.00000 | 0.00000E+00 | 0.00070 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00098 | 0.00000 | 0.00000E+00 | 0.00098 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00112 | 0.00000 | 0.00000E+00 | 0.00112 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00099 | 0.00000 | 0.00000E+00 | 0.00099 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00063 | 0.00000 | 0.00000E+00 | 0.00063 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00080 | 0.00000 | 0.00000E+00 | 0.00080 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00089 | 0.00000 | 0.00000E+00 | 0.00089 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00084 | 0.00000 | 0.00000E+00 | 0.00084 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00061 | 0.00000 | 0.00000E+00 | 0.00061 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00070 | 0.00000 | 0.00000E+00 | 0.00070 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00054 | 0.00000 | 0.00000E+00 | 0.00054 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00079 | 0.00000 | 0.00000E+00 | 0.00079 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00076 | 0.00000 | 0.00000E+00 | 0.00076 |
| 600138.3 | 4165809.31 | 2.45723 | 0.02561 | 0.00001 | 1.42936E-05 | 0.02562 |
| 600116.85 | 4165800.73 | 2.39714 | 0.02498 | 0.00002 | 2.85872E-05 | 0.02501 |
| 600084.67 | 4165785 | 2.09007 | 0.02178 | 0.00004 | 5.71743E-05 | 0.02184 |
| 600042.49 | 4165762.11 | 1.48036 | 0.01543 | 0.00007 | 1.00055E-04 | 0.01553 |
| 600006.02 | 4165743.52 | 0.91417 | 0.00953 | 0.00008 | 1.14349E-04 | 0.00964 |
| 599955.96 | 4165699.9 | 0.50206 | 0.00523 | 0.00005 | 7.14679E-05 | 0.00530 |
| 599899.58 | 4165667.19 | 0.37379 | 0.00390 | 0.00005 | 7.14679E-05 | 0.00397 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00256 | 0.00003 | 4.28807E-05 | 0.00260 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00244 | 0.00004 | 5.71743E-05 | 0.00250 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00158 | 0.00001 | 1.42936E-05 | 0.00160 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00274 | 0.00011 | 1.57229E-04 | 0.00289 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00239 | 0.00004 | 5.71743E-05 | 0.00244 |
| 600423.04 | 4165950.07 | 0.99324 | 0.01035 | 0.00000 | 0.00000E+00 | 0.01035 |
| 600450.99 | 4165951.23 | 0.84523 | 0.00881 | 0.00000 | 0.00000E+00 | 0.00881 |
| 600482.43 | 4165952.4 | 0.71015 | 0.00740 | 0.00000 | 0.00000E+00 | 0.00740 |
| 600513.87 | 4165944.25 | 0.60232 | 0.00628 | 0.00000 | 0.00000E+00 | 0.00628 |
| 600538.32 | 4165900 | 0.54825 | 0.00571 | 0.00000 | 0.00000E+00 | 0.00571 |
| 600535.99 | 4165872.05 | 0.56223 | 0.00586 | 0.00000 | 0.00000E+00 | 0.00586 |
| 600477.77 | 4165819.66 | 0.65837 | 0.00686 | 0.00000 | 0.00000E+00 | 0.00686 |
| 600395.1 | 4165790.55 | 0.77024 | 0.00803 | 0.00000 | 0.00000E+00 | 0.00803 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00297 | 0.00000 | 0.00000E+00 | 0.00297 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00197 | 0.00000 | 0.00000E+00 | 0.00197 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00151 | 0.00000 | 0.00000E+00 | 0.00151 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00112 | 0.00001 | 1.42936E-05 | 0.00114 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00097 | 0.00001 | 1.42936E-05 | 0.00099 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00078 | 0.00000 | 0.00000E+00 | 0.00078 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00065 | 0.00000 | 0.00000E+00 | 0.00065 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00053 | 0.00000 | 0.00000E+00 | 0.00053 |
| 599480.55 | 4165898.91 | 0.61514 | 0.00641 | 0.00001 | 1.42936E-05 | 0.00642 |
| 599529.46 | 4165748.7 | 0.42305 | 0.00441 | 0.00005 | 7.14679E-05 | 0.00448 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00201 | 0.00001 | 1.42936E-05 | 0.00203 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

## Spotorno Ranch

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Infant**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | Unit DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 3rd Trimester | 1 | 10 | 361 | 0.85 | 0.25 | 11.6 |
| 1 | 1 | 10 | 1090 | 0.85 | 1 | 139.6 |
| 2 | 1 | 10 | 1090 | 0.85 | 1 | 139.6 |
| 3 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **No Mitigation** **at Sensitive Recptors**

**Estimated Cancer Risks from Construction DPM - Infant Receptors**

| X (m) | Y (m) | InfantCancer Risk (3rd Trimester) 2018 (/million) | Infant Cancer Risk (year 1) 2018 (/million) | Infant Cancer Risk (year 2) 2019 (/million) | Child Cancer Risk (year 1) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.766 | 9.250 | 4.644 | 0.443 | 15.10305 |
| 599733.16 | 4165874.92 | 0.515 | 6.217 | 3.122 | 0.298 | 10.15244 |
| 599741.25 | 4165874.65 | 0.528 | 6.372 | 3.200 | 0.306 | 10.40593 |
| 599741.25 | 4165858.74 | 0.427 | 5.152 | 2.588 | 0.247 | 8.41420 |
| 599743.41 | 4165868.72 | 0.488 | 5.896 | 2.961 | 0.283 | 9.62869 |
| 599699.19 | 4165884.9 | 0.515 | 6.217 | 3.122 | 0.298 | 10.15143 |
| 599688.4 | 4165885.17 | 0.493 | 5.953 | 2.990 | 0.286 | 9.72176 |
| 599674.38 | 4165884.36 | 0.466 | 5.628 | 2.827 | 0.270 | 9.19152 |
| 599679.23 | 4165849.84 | 0.333 | 4.016 | 2.018 | 0.193 | 6.56018 |
| 599688.13 | 4165850.38 | 0.339 | 4.100 | 2.061 | 0.197 | 6.69701 |
| 599735.05 | 4165820.18 | 0.293 | 3.544 | 1.781 | 0.170 | 5.78876 |
| 599730.2 | 4165813.44 | 0.277 | 3.341 | 1.680 | 0.160 | 5.45834 |
| 599727.23 | 4165806.7 | 0.263 | 3.175 | 1.597 | 0.152 | 5.18708 |
| 599700.27 | 4165802.66 | 0.244 | 2.953 | 1.485 | 0.142 | 4.82416 |
| 599633.92 | 4165882.15 | 0.404 | 4.876 | 2.450 | 0.234 | 7.96323 |
| 599610.98 | 4165795.75 | 0.207 | 2.504 | 1.264 | 0.121 | 4.09602 |
| 599618.85 | 4165755 | 0.169 | 2.041 | 1.031 | 0.098 | 3.33962 |
| 599633.15 | 4165749.99 | 0.168 | 2.026 | 1.024 | 0.098 | 3.31583 |
| 599734.53 | 4165764.17 | 0.210 | 2.532 | 1.278 | 0.122 | 4.14092 |
| 599721.84 | 4165775.36 | 0.217 | 2.621 | 1.323 | 0.126 | 4.28694 |
| 599731.91 | 4165723.49 | 0.169 | 2.037 | 1.033 | 0.098 | 3.33713 |
| 599589.04 | 4166098.06 | 0.148 | 1.783 | 0.894 | 0.085 | 2.91057 |
| 599589.04 | 4166077.92 | 0.212 | 2.555 | 1.282 | 0.122 | 4.17062 |
| 599561.14 | 4166065 | 0.181 | 2.191 | 1.099 | 0.105 | 3.57597 |
| 599693.38 | 4166143.01 | 0.339 | 4.100 | 2.056 | 0.196 | 6.69179 |
| 599756.4 | 4166195.69 | 0.241 | 2.915 | 1.462 | 0.140 | 4.75856 |
| 599715.6 | 4166214.81 | 0.143 | 1.726 | 0.866 | 0.083 | 2.81695 |
| 599593.69 | 4166198.79 | 0.053 | 0.642 | 0.322 | 0.031 | 1.04770 |
| 599813.42 | 4166193.21 | 0.326 | 3.936 | 1.974 | 0.189 | 6.42536 |
| 599855.57 | 4166198.04 | 0.350 | 4.225 | 2.119 | 0.202 | 6.89657 |
| 599993.73 | 4166279.68 | 0.179 | 2.165 | 1.086 | 0.104 | 3.53423 |
| 599986.85 | 4166279.22 | 0.179 | 2.166 | 1.086 | 0.104 | 3.53543 |
| 599994.19 | 4166267.07 | 0.198 | 2.392 | 1.200 | 0.115 | 3.90419 |
| 599805.61 | 4166278.22 | 0.131 | 1.588 | 0.797 | 0.076 | 2.59220 |
| 599653.74 | 4166315.93 | 0.046 | 0.552 | 0.277 | 0.026 | 0.90101 |
| 599693 | 4166325.23 | 0.055 | 0.663 | 0.333 | 0.032 | 1.08301 |
| 599682.15 | 4166339.17 | 0.048 | 0.582 | 0.292 | 0.028 | 0.94919 |
| 599657.87 | 4166284.42 | 0.055 | 0.659 | 0.331 | 0.032 | 1.07611 |
| 599664.07 | 4166261.69 | 0.065 | 0.783 | 0.393 | 0.038 | 1.27828 |
| 599718.31 | 4166304.56 | 0.071 | 0.859 | 0.431 | 0.041 | 1.40211 |
| 599643.92 | 4166338.66 | 0.039 | 0.475 | 0.238 | 0.023 | 0.77611 |
| 599749.31 | 4166342.79 | 0.065 | 0.785 | 0.394 | 0.038 | 1.28082 |
| 599773.58 | 4166308.18 | 0.091 | 1.094 | 0.549 | 0.052 | 1.78514 |
| 599787.53 | 4166296.81 | 0.105 | 1.265 | 0.634 | 0.061 | 2.06457 |
| 599439.45 | 4166224.05 | 0.023 | 0.274 | 0.137 | 0.013 | 0.44709 |
| 599416.62 | 4166137.54 | 0.032 | 0.384 | 0.193 | 0.018 | 0.62728 |
| 599424.09 | 4166124.37 | 0.036 | 0.440 | 0.221 | 0.021 | 0.71861 |
| 599429.36 | 4166143.69 | 0.032 | 0.389 | 0.195 | 0.019 | 0.63545 |
| 599458.78 | 4166272.79 | 0.021 | 0.250 | 0.125 | 0.012 | 0.40782 |
| 599538.7 | 4166310.99 | 0.026 | 0.314 | 0.157 | 0.015 | 0.51222 |
| 599565.92 | 4166311.87 | 0.029 | 0.351 | 0.176 | 0.017 | 0.57233 |
| 599348.53 | 4166130.26 | 0.027 | 0.332 | 0.166 | 0.016 | 0.54124 |
| 599383.18 | 4166205.02 | 0.020 | 0.240 | 0.120 | 0.012 | 0.39207 |
| 599364.34 | 4166167.94 | 0.023 | 0.274 | 0.137 | 0.013 | 0.44736 |
| 599485.89 | 4166401.33 | 0.018 | 0.214 | 0.107 | 0.010 | 0.34925 |
| 599574.63 | 4166367.9 | 0.026 | 0.310 | 0.155 | 0.015 | 0.50532 |
| 599591.04 | 4166409.84 | 0.025 | 0.298 | 0.150 | 0.014 | 0.48723 |
| 600138.3 | 4165809.31 | 0.835 | 10.088 | 5.064 | 0.484 | 16.47024 |
| 600116.85 | 4165800.73 | 0.815 | 9.841 | 4.944 | 0.472 | 16.07200 |
| 600084.67 | 4165785 | 0.710 | 8.581 | 4.320 | 0.412 | 14.02317 |
| 600042.49 | 4165762.11 | 0.503 | 6.078 | 3.076 | 0.293 | 9.95077 |
| 600006.02 | 4165743.52 | 0.311 | 3.754 | 1.914 | 0.182 | 6.16116 |
| 599955.96 | 4165699.9 | 0.171 | 2.062 | 1.054 | 0.100 | 3.38638 |
| 599899.58 | 4165667.19 | 0.127 | 1.535 | 0.790 | 0.075 | 2.52684 |
| 599879.52 | 4165617.35 | 0.083 | 1.008 | 0.517 | 0.049 | 1.65760 |
| 599739.82 | 4165597.07 | 0.080 | 0.963 | 0.498 | 0.047 | 1.58777 |
| 599821.24 | 4165543.08 | 0.052 | 0.624 | 0.317 | 0.030 | 1.02263 |
| 599661.78 | 4165616.02 | 0.089 | 1.079 | 0.584 | 0.055 | 1.80759 |
| 599593.85 | 4165593.14 | 0.078 | 0.941 | 0.487 | 0.046 | 1.55226 |
| 600423.04 | 4165950.07 | 0.338 | 4.077 | 2.045 | 0.195 | 6.65567 |
| 600450.99 | 4165951.23 | 0.287 | 3.470 | 1.740 | 0.166 | 5.66386 |
| 600482.43 | 4165952.4 | 0.241 | 2.915 | 1.462 | 0.140 | 4.75869 |
| 600513.87 | 4165944.25 | 0.205 | 2.473 | 1.240 | 0.118 | 4.03613 |
| 600538.32 | 4165900 | 0.186 | 2.251 | 1.129 | 0.108 | 3.67381 |
| 600535.99 | 4165872.05 | 0.191 | 2.308 | 1.158 | 0.111 | 3.76749 |
| 600477.77 | 4165819.66 | 0.224 | 2.703 | 1.356 | 0.130 | 4.41172 |
| 600395.1 | 4165790.55 | 0.262 | 3.162 | 1.586 | 0.152 | 5.16136 |
| 600400.92 | 4165624.03 | 0.097 | 1.170 | 0.587 | 0.056 | 1.90917 |
| 600405.57 | 4165563.49 | 0.064 | 0.775 | 0.389 | 0.037 | 1.26508 |
| 600431.19 | 4165518.07 | 0.049 | 0.593 | 0.298 | 0.028 | 0.96836 |
| 599776.32 | 4165483.21 | 0.037 | 0.443 | 0.226 | 0.021 | 0.72678 |
| 599825.22 | 4165468.07 | 0.032 | 0.383 | 0.196 | 0.019 | 0.62908 |
| 599828.71 | 4165423.82 | 0.025 | 0.305 | 0.153 | 0.015 | 0.49849 |
| 599818.23 | 4165383.07 | 0.021 | 0.255 | 0.128 | 0.012 | 0.41606 |
| 599825.22 | 4165336.49 | 0.017 | 0.208 | 0.104 | 0.010 | 0.33934 |
| 599480.55 | 4165898.91 | 0.209 | 2.525 | 1.271 | 0.121 | 4.12645 |
| 599529.46 | 4165748.7 | 0.144 | 1.737 | 0.891 | 0.085 | 2.85693 |
| 599489.86 | 4165591.5 | 0.066 | 0.794 | 0.402 | 0.038 | 1.29971 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00000 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00000 |

**Maximum Caner Risk**
16.5
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
Yes

## Spotorno Ranch

**No Mitigation**

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Child**
**UTM: (565046,4185977)**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |
| 2 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |
| 3 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **No Mitigation** **at Sensitive Receptors**

**Estimated Cancer Risks from Construction DPM**

| X (m) | Y (m) | Child Cancer Risk (year 1) 2018 (/million) | Child Cancer Risk (year 2) 2019 (/million) | Child Cancer Risk (year 3) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 1.251 | 0.628 | 0.443 | 2.32 |
| 599733.16 | 4165874.92 | 0.841 | 0.422 | 0.298 | 1.56 |
| 599741.25 | 4165874.65 | 0.862 | 0.433 | 0.306 | 1.60 |
| 599741.25 | 4165858.74 | 0.697 | 0.350 | 0.247 | 1.29 |
| 599743.41 | 4165868.72 | 0.797 | 0.400 | 0.283 | 1.48 |
| 599699.19 | 4165884.9 | 0.841 | 0.422 | 0.298 | 1.56 |
| 599688.4 | 4165885.17 | 0.805 | 0.404 | 0.286 | 1.49 |
| 599674.38 | 4165884.36 | 0.761 | 0.382 | 0.270 | 1.41 |
| 599679.23 | 4165849.84 | 0.543 | 0.273 | 0.193 | 1.01 |
| 599688.13 | 4165850.38 | 0.554 | 0.279 | 0.197 | 1.03 |
| 599735.05 | 4165820.18 | 0.479 | 0.241 | 0.170 | 0.89 |
| 599730.2 | 4165813.44 | 0.452 | 0.227 | 0.160 | 0.84 |
| 599727.23 | 4165806.7 | 0.429 | 0.216 | 0.152 | 0.80 |
| 599700.27 | 4165802.66 | 0.399 | 0.201 | 0.142 | 0.74 |
| 599633.92 | 4165882.15 | 0.659 | 0.331 | 0.234 | 1.22 |
| 599610.98 | 4165795.75 | 0.339 | 0.171 | 0.121 | 0.63 |
| 599618.85 | 4165755 | 0.276 | 0.139 | 0.098 | 0.51 |
| 599633.15 | 4165749.99 | 0.274 | 0.138 | 0.098 | 0.51 |
| 599734.53 | 4165764.17 | 0.342 | 0.173 | 0.122 | 0.64 |
| 599721.84 | 4165775.36 | 0.354 | 0.179 | 0.126 | 0.66 |
| 599731.91 | 4165723.49 | 0.275 | 0.140 | 0.098 | 0.51 |
| 599589.04 | 4166098.06 | 0.241 | 0.121 | 0.085 | 0.45 |
| 599589.04 | 4166077.92 | 0.345 | 0.173 | 0.122 | 0.64 |
| 599561.14 | 4166065 | 0.296 | 0.149 | 0.105 | 0.55 |
| 599693.38 | 4166143.01 | 0.554 | 0.278 | 0.196 | 1.03 |
| 599756.4 | 4166195.69 | 0.394 | 0.198 | 0.140 | 0.73 |
| 599715.6 | 4166214.81 | 0.233 | 0.117 | 0.083 | 0.43 |
| 599593.69 | 4166198.79 | 0.087 | 0.044 | 0.031 | 0.16 |
| 599813.42 | 4166193.21 | 0.532 | 0.267 | 0.189 | 0.99 |
| 599855.57 | 4166198.04 | 0.571 | 0.287 | 0.202 | 1.06 |
| 599993.73 | 4166279.68 | 0.293 | 0.147 | 0.104 | 0.54 |
| 599986.85 | 4166279.22 | 0.293 | 0.147 | 0.104 | 0.54 |
| 599994.19 | 4166267.07 | 0.323 | 0.162 | 0.115 | 0.60 |
| 599805.61 | 4166278.22 | 0.215 | 0.108 | 0.076 | 0.40 |
| 599653.74 | 4166315.93 | 0.075 | 0.037 | 0.026 | 0.14 |
| 599693 | 4166325.23 | 0.090 | 0.045 | 0.032 | 0.17 |
| 599682.15 | 4166339.17 | 0.079 | 0.039 | 0.028 | 0.15 |
| 599657.87 | 4166284.42 | 0.089 | 0.045 | 0.032 | 0.17 |
| 599664.07 | 4166261.69 | 0.106 | 0.053 | 0.038 | 0.20 |
| 599718.31 | 4166304.56 | 0.116 | 0.058 | 0.041 | 0.22 |
| 599643.92 | 4166338.66 | 0.064 | 0.032 | 0.023 | 0.12 |
| 599749.31 | 4166342.79 | 0.106 | 0.053 | 0.038 | 0.20 |
| 599773.58 | 4166308.18 | 0.148 | 0.074 | 0.052 | 0.27 |
| 599787.53 | 4166296.81 | 0.171 | 0.086 | 0.061 | 0.32 |
| 599439.45 | 4166224.05 | 0.037 | 0.019 | 0.013 | 0.07 |
| 599416.62 | 4166137.54 | 0.052 | 0.026 | 0.018 | 0.10 |
| 599424.09 | 4166124.37 | 0.060 | 0.030 | 0.021 | 0.11 |
| 599429.36 | 4166143.69 | 0.053 | 0.026 | 0.019 | 0.10 |
| 599458.78 | 4166272.79 | 0.034 | 0.017 | 0.012 | 0.06 |
| 599538.7 | 4166310.99 | 0.042 | 0.021 | 0.015 | 0.08 |
| 599565.92 | 4166311.87 | 0.047 | 0.024 | 0.017 | 0.09 |
| 599348.53 | 4166130.26 | 0.045 | 0.022 | 0.016 | 0.08 |
| 599383.18 | 4166205.02 | 0.032 | 0.016 | 0.012 | 0.06 |
| 599364.34 | 4166167.94 | 0.037 | 0.019 | 0.013 | 0.07 |
| 599485.89 | 4166401.33 | 0.029 | 0.015 | 0.010 | 0.05 |
| 599574.63 | 4166367.9 | 0.042 | 0.021 | 0.015 | 0.08 |
| 599591.04 | 4166409.84 | 0.040 | 0.020 | 0.014 | 0.07 |
| 600138.3 | 4165809.31 | 1.364 | 0.685 | 0.484 | 2.53 |
| 600116.85 | 4165800.73 | 1.331 | 0.668 | 0.472 | 2.47 |
| 600084.67 | 4165785 | 1.160 | 0.584 | 0.412 | 2.16 |
| 600042.49 | 4165762.11 | 0.822 | 0.416 | 0.293 | 1.53 |
| 600006.02 | 4165743.52 | 0.508 | 0.259 | 0.182 | 0.95 |
| 599955.96 | 4165699.9 | 0.279 | 0.142 | 0.100 | 0.52 |
| 599899.58 | 4165667.19 | 0.208 | 0.107 | 0.075 | 0.39 |
| 599879.52 | 4165617.35 | 0.136 | 0.070 | 0.049 | 0.26 |
| 599739.82 | 4165597.07 | 0.130 | 0.067 | 0.047 | 0.24 |
| 599821.24 | 4165543.08 | 0.084 | 0.043 | 0.030 | 0.16 |
| 599661.78 | 4165616.02 | 0.146 | 0.079 | 0.055 | 0.28 |
| 599593.85 | 4165593.14 | 0.127 | 0.066 | 0.046 | 0.24 |
| 600423.04 | 4165950.07 | 0.551 | 0.277 | 0.195 | 1.02 |
| 600450.99 | 4165951.23 | 0.469 | 0.235 | 0.166 | 0.87 |
| 600482.43 | 4165952.4 | 0.394 | 0.198 | 0.140 | 0.73 |
| 600513.87 | 4165944.25 | 0.334 | 0.168 | 0.118 | 0.62 |
| 600538.32 | 4165900 | 0.304 | 0.153 | 0.108 | 0.56 |
| 600535.99 | 4165872.05 | 0.312 | 0.157 | 0.111 | 0.58 |
| 600477.77 | 4165819.66 | 0.365 | 0.183 | 0.130 | 0.68 |
| 600395.1 | 4165790.55 | 0.428 | 0.214 | 0.152 | 0.79 |
| 600400.92 | 4165624.03 | 0.158 | 0.079 | 0.056 | 0.29 |
| 600405.57 | 4165563.49 | 0.105 | 0.053 | 0.037 | 0.19 |
| 600431.19 | 4165518.07 | 0.080 | 0.040 | 0.028 | 0.15 |
| 599776.32 | 4165483.21 | 0.060 | 0.031 | 0.021 | 0.11 |
| 599825.22 | 4165468.07 | 0.052 | 0.026 | 0.019 | 0.10 |
| 599828.71 | 4165423.82 | 0.041 | 0.021 | 0.015 | 0.08 |
| 599818.23 | 4165383.07 | 0.034 | 0.017 | 0.012 | 0.06 |
| 599825.22 | 4165336.49 | 0.028 | 0.014 | 0.010 | 0.05 |
| 599480.55 | 4165898.91 | 0.341 | 0.172 | 0.121 | 0.63 |
| 599529.46 | 4165748.7 | 0.235 | 0.120 | 0.085 | 0.44 |
| 599489.86 | 4165591.5 | 0.107 | 0.054 | 0.038 | 0.20 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.00 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.00 |

**Maximum Caner Risk**
2.5
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
No

## Spotorno Ranch

**No Mitigation**

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Adult**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |
| 2 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |
| 3 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **at Sensitive Receptors**

**Estimated Cancer Risks from Construction DPM**

| X (m) | Y (m) | Adult Cancer Risk (year 1) 2018 (/million) | Adult Cancer Risk (year 2) 2019 (/million) | Adult Cancer Risk (year 3) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.188 | 0.094 | 0.067 | 0.34833 |
| 599733.16 | 4165874.92 | 0.126 | 0.063 | 0.045 | 0.23416 |
| 599741.25 | 4165874.65 | 0.129 | 0.065 | 0.046 | 0.24000 |
| 599741.25 | 4165858.74 | 0.105 | 0.052 | 0.037 | 0.19407 |
| 599743.41 | 4165868.72 | 0.120 | 0.060 | 0.042 | 0.22208 |
| 599699.19 | 4165884.9 | 0.126 | 0.063 | 0.045 | 0.23414 |
| 599688.4 | 4165885.17 | 0.121 | 0.061 | 0.043 | 0.22423 |
| 599674.38 | 4165884.36 | 0.114 | 0.057 | 0.040 | 0.21200 |
| 599679.23 | 4165849.84 | 0.081 | 0.041 | 0.029 | 0.15131 |
| 599688.13 | 4165850.38 | 0.083 | 0.042 | 0.030 | 0.15447 |
| 599735.05 | 4165820.18 | 0.072 | 0.036 | 0.026 | 0.13352 |
| 599730.2 | 4165813.44 | 0.068 | 0.034 | 0.024 | 0.12590 |
| 599727.23 | 4165806.7 | 0.064 | 0.032 | 0.023 | 0.11965 |
| 599700.27 | 4165802.66 | 0.060 | 0.030 | 0.021 | 0.11128 |
| 599633.92 | 4165882.15 | 0.099 | 0.050 | 0.035 | 0.18367 |
| 599610.98 | 4165795.75 | 0.051 | 0.026 | 0.018 | 0.09451 |
| 599618.85 | 4165755 | 0.041 | 0.021 | 0.015 | 0.07706 |
| 599633.15 | 4165749.99 | 0.041 | 0.021 | 0.015 | 0.07651 |
| 599734.53 | 4165764.17 | 0.051 | 0.026 | 0.018 | 0.09554 |
| 599721.84 | 4165775.36 | 0.053 | 0.027 | 0.019 | 0.09891 |
| 599731.91 | 4165723.49 | 0.041 | 0.021 | 0.015 | 0.07703 |
| 599589.04 | 4166098.06 | 0.036 | 0.018 | 0.013 | 0.06712 |
| 599589.04 | 4166077.92 | 0.052 | 0.026 | 0.018 | 0.09618 |
| 599561.14 | 4166065 | 0.044 | 0.022 | 0.016 | 0.08247 |
| 599693.38 | 4166143.01 | 0.083 | 0.042 | 0.029 | 0.15433 |
| 599756.4 | 4166195.69 | 0.059 | 0.030 | 0.021 | 0.10974 |
| 599715.6 | 4166214.81 | 0.035 | 0.018 | 0.012 | 0.06496 |
| 599593.69 | 4166198.79 | 0.013 | 0.007 | 0.005 | 0.02416 |
| 599813.42 | 4166193.21 | 0.080 | 0.040 | 0.028 | 0.14818 |
| 599855.57 | 4166198.04 | 0.086 | 0.043 | 0.030 | 0.15905 |
| 599993.73 | 4166279.68 | 0.044 | 0.022 | 0.016 | 0.08151 |
| 599986.85 | 4166279.22 | 0.044 | 0.022 | 0.016 | 0.08153 |
| 599994.19 | 4166267.07 | 0.049 | 0.024 | 0.017 | 0.09004 |
| 599805.61 | 4166278.22 | 0.032 | 0.016 | 0.011 | 0.05978 |
| 599653.74 | 4166315.93 | 0.011 | 0.006 | 0.004 | 0.02078 |
| 599693 | 4166325.23 | 0.013 | 0.007 | 0.005 | 0.02498 |
| 599682.15 | 4166339.17 | 0.012 | 0.006 | 0.004 | 0.02189 |
| 599657.87 | 4166284.42 | 0.013 | 0.007 | 0.005 | 0.02482 |
| 599664.07 | 4166261.69 | 0.016 | 0.008 | 0.006 | 0.02948 |
| 599718.31 | 4166304.56 | 0.017 | 0.009 | 0.006 | 0.03234 |
| 599643.92 | 4166338.66 | 0.010 | 0.005 | 0.003 | 0.01790 |
| 599749.31 | 4166342.79 | 0.016 | 0.008 | 0.006 | 0.02954 |
| 599773.58 | 4166308.18 | 0.022 | 0.011 | 0.008 | 0.04117 |
| 599787.53 | 4166296.81 | 0.026 | 0.013 | 0.009 | 0.04761 |
| 599439.45 | 4166224.05 | 0.006 | 0.003 | 0.002 | 0.01031 |
| 599416.62 | 4166137.54 | 0.008 | 0.004 | 0.003 | 0.01447 |
| 599424.09 | 4166124.37 | 0.009 | 0.004 | 0.003 | 0.01657 |
| 599429.36 | 4166143.69 | 0.008 | 0.004 | 0.003 | 0.01465 |
| 599458.78 | 4166272.79 | 0.005 | 0.003 | 0.002 | 0.00941 |
| 599538.7 | 4166310.99 | 0.006 | 0.003 | 0.002 | 0.01181 |
| 599565.92 | 4166311.87 | 0.007 | 0.004 | 0.003 | 0.01320 |
| 599348.53 | 4166130.26 | 0.007 | 0.003 | 0.002 | 0.01248 |
| 599383.18 | 4166205.02 | 0.005 | 0.002 | 0.002 | 0.00904 |
| 599364.34 | 4166167.94 | 0.006 | 0.003 | 0.002 | 0.01032 |
| 599485.89 | 4166401.33 | 0.004 | 0.002 | 0.002 | 0.00805 |
| 599574.63 | 4166367.9 | 0.006 | 0.003 | 0.002 | 0.01165 |
| 599591.04 | 4166409.84 | 0.006 | 0.003 | 0.002 | 0.01124 |
| 600138.3 | 4165809.31 | 0.205 | 0.103 | 0.073 | 0.37986 |
| 600116.85 | 4165800.73 | 0.200 | 0.100 | 0.071 | 0.37070 |
| 600084.67 | 4165785 | 0.174 | 0.088 | 0.062 | 0.32349 |
| 600042.49 | 4165762.11 | 0.123 | 0.062 | 0.044 | 0.22964 |
| 600006.02 | 4165743.52 | 0.076 | 0.039 | 0.027 | 0.14227 |
| 599955.96 | 4165699.9 | 0.042 | 0.021 | 0.015 | 0.07821 |
| 599899.58 | 4165667.19 | 0.031 | 0.016 | 0.011 | 0.05839 |
| 599879.52 | 4165617.35 | 0.020 | 0.010 | 0.007 | 0.03830 |
| 599739.82 | 4165597.07 | 0.020 | 0.010 | 0.007 | 0.03671 |
| 599821.24 | 4165543.08 | 0.013 | 0.006 | 0.005 | 0.02361 |
| 599661.78 | 4165616.02 | 0.022 | 0.012 | 0.008 | 0.04193 |
| 599593.85 | 4165593.14 | 0.019 | 0.010 | 0.007 | 0.03589 |
| 600423.04 | 4165950.07 | 0.083 | 0.041 | 0.029 | 0.15349 |
| 600450.99 | 4165951.23 | 0.070 | 0.035 | 0.025 | 0.13062 |
| 600482.43 | 4165952.4 | 0.059 | 0.030 | 0.021 | 0.10975 |
| 600513.87 | 4165944.25 | 0.050 | 0.025 | 0.018 | 0.09308 |
| 600538.32 | 4165900 | 0.046 | 0.023 | 0.016 | 0.08473 |
| 600535.99 | 4165872.05 | 0.047 | 0.023 | 0.017 | 0.08689 |
| 600477.77 | 4165819.66 | 0.055 | 0.027 | 0.019 | 0.10174 |
| 600395.1 | 4165790.55 | 0.064 | 0.032 | 0.023 | 0.11903 |
| 600400.92 | 4165624.03 | 0.024 | 0.012 | 0.008 | 0.04403 |
| 600405.57 | 4165563.49 | 0.016 | 0.008 | 0.006 | 0.02918 |
| 600431.19 | 4165518.07 | 0.012 | 0.006 | 0.004 | 0.02233 |
| 599776.32 | 4165483.21 | 0.009 | 0.005 | 0.003 | 0.01678 |
| 599825.22 | 4165468.07 | 0.008 | 0.004 | 0.003 | 0.01453 |
| 599828.71 | 4165423.82 | 0.006 | 0.003 | 0.002 | 0.01150 |
| 599818.23 | 4165383.07 | 0.005 | 0.003 | 0.002 | 0.00960 |
| 599825.22 | 4165336.49 | 0.004 | 0.002 | 0.001 | 0.00783 |
| 599480.55 | 4165898.91 | 0.051 | 0.026 | 0.018 | 0.09519 |
| 599529.46 | 4165748.7 | 0.035 | 0.018 | 0.013 | 0.06600 |
| 599489.86 | 4165591.5 | 0.016 | 0.008 | 0.006 | 0.03000 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.00000 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.00000 |

**Maximum Caner Risk**
0.4
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
No

**Spotorno Ranch**

**No Mitigation**
**at Sensitive Receptors**

**Chronic Non-Cancer Hazard Index**

**Reference Exposure Level (REL) for DPM:** 5 ug/m3

**CNCHI = DPM/REL**

| X (m) | Y (m) | 2018 DPM (ug/m3) | 2019 DPM (ug/m3) | 2020 DPM (ug/m3) | Max DPM (ug/m3) | CNCHI |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.066257 | 0.033261 | 0.023494 | 0.066 | 0.01325 |
| 599733.16 | 4165874.92 | 0.044533 | 0.022365 | 0.015795 | 0.045 | 0.00891 |
| 599741.25 | 4165874.65 | 0.045645 | 0.022923 | 0.016189 | 0.046 | 0.00913 |
| 599741.25 | 4165858.74 | 0.036905 | 0.018539 | 0.013092 | 0.037 | 0.00738 |
| 599743.41 | 4165868.72 | 0.042234 | 0.021212 | 0.014981 | 0.042 | 0.00845 |
| 599699.19 | 4165884.9 | 0.044528 | 0.022363 | 0.015794 | 0.045 | 0.00891 |
| 599688.4 | 4165885.17 | 0.042643 | 0.021417 | 0.015126 | 0.043 | 0.00853 |
| 599674.38 | 4165884.36 | 0.040316 | 0.02025 | 0.014301 | 0.040 | 0.00806 |
| 599679.23 | 4165849.84 | 0.028769 | 0.014458 | 0.010209 | 0.029 | 0.00575 |
| 599688.13 | 4165850.38 | 0.029369 | 0.014759 | 0.010422 | 0.029 | 0.00587 |
| 599735.05 | 4165820.18 | 0.025384 | 0.01276 | 0.009009 | 0.025 | 0.00508 |
| 599730.2 | 4165813.44 | 0.023934 | 0.012033 | 0.008496 | 0.024 | 0.00479 |
| 599727.23 | 4165806.7 | 0.022744 | 0.011436 | 0.008074 | 0.023 | 0.00455 |
| 599700.27 | 4165802.66 | 0.021151 | 0.010637 | 0.007509 | 0.021 | 0.00423 |
| 599633.92 | 4165882.15 | 0.034926 | 0.017546 | 0.012391 | 0.035 | 0.00699 |
| 599610.98 | 4165795.75 | 0.017938 | 0.009053 | 0.006384 | 0.018 | 0.00359 |
| 599618.85 | 4165755 | 0.014618 | 0.007388 | 0.005208 | 0.015 | 0.00292 |
| 599633.15 | 4165749.99 | 0.014514 | 0.007336 | 0.005171 | 0.015 | 0.00290 |
| 599734.53 | 4165764.17 | 0.018135 | 0.009152 | 0.006454 | 0.018 | 0.00363 |
| 599721.84 | 4165775.36 | 0.018775 | 0.009473 | 0.006681 | 0.019 | 0.00376 |
| 599731.91 | 4165723.49 | 0.014589 | 0.007402 | 0.005212 | 0.015 | 0.00292 |
| 599589.04 | 4166098.06 | 0.012772 | 0.006406 | 0.004526 | 0.013 | 0.00255 |
| 599589.04 | 4166077.92 | 0.018301 | 0.00918 | 0.006486 | 0.018 | 0.00366 |
| 599561.14 | 4166065 | 0.015692 | 0.007871 | 0.005561 | 0.016 | 0.00314 |
| 599693.38 | 4166143.01 | 0.029365 | 0.014729 | 0.010406 | 0.029 | 0.00587 |
| 599756.4 | 4166195.69 | 0.020881 | 0.010474 | 0.0074 | 0.021 | 0.00418 |
| 599715.6 | 4166214.81 | 0.012361 | 0.0062 | 0.004381 | 0.012 | 0.00247 |
| 599593.69 | 4166198.79 | 0.004597 | 0.002306 | 0.001629 | 0.005 | 0.00092 |
| 599813.42 | 4166193.21 | 0.028196 | 0.014143 | 0.009992 | 0.028 | 0.00564 |
| 599855.57 | 4166198.04 | 0.030263 | 0.01518 | 0.010725 | 0.030 | 0.00605 |
| 599993.73 | 4166279.68 | 0.015509 | 0.007779 | 0.005496 | 0.016 | 0.00310 |
| 599986.85 | 4166279.22 | 0.015514 | 0.007782 | 0.005498 | 0.016 | 0.00310 |
| 599994.19 | 4166267.07 | 0.017132 | 0.008593 | 0.006071 | 0.017 | 0.00343 |
| 599805.61 | 4166278.22 | 0.011375 | 0.005706 | 0.004031 | 0.011 | 0.00228 |
| 599653.74 | 4166315.93 | 0.003954 | 0.001983 | 0.001401 | 0.004 | 0.00079 |
| 599693 | 4166325.23 | 0.004752 | 0.002384 | 0.001684 | 0.005 | 0.00095 |
| 599682.15 | 4166339.17 | 0.004165 | 0.002089 | 0.001476 | 0.004 | 0.00083 |
| 599657.87 | 4166284.42 | 0.004722 | 0.002369 | 0.001673 | 0.005 | 0.00094 |
| 599664.07 | 4166261.69 | 0.005609 | 0.002814 | 0.001988 | 0.006 | 0.00112 |
| 599718.31 | 4166304.56 | 0.006153 | 0.003086 | 0.00218 | 0.006 | 0.00123 |
| 599643.92 | 4166338.66 | 0.003406 | 0.001708 | 0.001207 | 0.003 | 0.00068 |
| 599749.31 | 4166342.79 | 0.005621 | 0.002819 | 0.001992 | 0.006 | 0.00112 |
| 599773.58 | 4166308.18 | 0.007834 | 0.003929 | 0.002776 | 0.008 | 0.00157 |
| 599787.53 | 4166296.81 | 0.00906 | 0.004544 | 0.003211 | 0.009 | 0.00181 |
| 599439.45 | 4166224.05 | 0.001962 | 0.000984 | 0.000695 | 0.002 | 0.00039 |
| 599416.62 | 4166137.54 | 0.002753 | 0.001381 | 0.000975 | 0.003 | 0.00055 |
| 599424.09 | 4166124.37 | 0.003153 | 0.001582 | 0.001117 | 0.003 | 0.00063 |
| 599429.36 | 4166143.69 | 0.002788 | 0.001399 | 0.000988 | 0.003 | 0.00056 |
| 599458.78 | 4166272.79 | 0.00179 | 0.000898 | 0.000634 | 0.002 | 0.00036 |
| 599538.7 | 4166310.99 | 0.002248 | 0.001127 | 0.000797 | 0.002 | 0.00045 |
| 599565.92 | 4166311.87 | 0.002511 | 0.00126 | 0.00089 | 0.003 | 0.00050 |
| 599348.53 | 4166130.26 | 0.002375 | 0.001191 | 0.000842 | 0.002 | 0.00048 |
| 599383.18 | 4166205.02 | 0.00172 | 0.000863 | 0.00061 | 0.002 | 0.00034 |
| 599364.34 | 4166167.94 | 0.001963 | 0.000985 | 0.000696 | 0.002 | 0.00039 |
| 599485.89 | 4166401.33 | 0.001533 | 0.000769 | 0.000543 | 0.002 | 0.00031 |
| 599574.63 | 4166367.9 | 0.002217 | 0.001112 | 0.000786 | 0.002 | 0.00044 |
| 599591.04 | 4166409.84 | 0.002138 | 0.001072 | 0.000758 | 0.002 | 0.00043 |
| 600138.3 | 4165809.31 | 0.072256 | 0.036271 | 0.02562 | 0.072 | 0.01445 |
| 600116.85 | 4165800.73 | 0.07049 | 0.035413 | 0.025008 | 0.070 | 0.01410 |
| 600084.67 | 4165785 | 0.061463 | 0.030941 | 0.021837 | 0.061 | 0.01229 |
| 600042.49 | 4165762.11 | 0.043538 | 0.022034 | 0.015526 | 0.044 | 0.00871 |
| 600006.02 | 4165743.52 | 0.02689 | 0.013712 | 0.00964 | 0.027 | 0.00538 |
| 599955.96 | 4165699.9 | 0.014769 | 0.007548 | 0.005303 | 0.015 | 0.00295 |
| 599899.58 | 4165667.19 | 0.010997 | 0.005656 | 0.003967 | 0.011 | 0.00220 |
| 599879.52 | 4165617.35 | 0.007219 | 0.003705 | 0.0026 | 0.007 | 0.00144 |
| 599739.82 | 4165597.07 | 0.006894 | 0.00357 | 0.002499 | 0.007 | 0.00138 |
| 599821.24 | 4165543.08 | 0.004469 | 0.00227 | 0.001598 | 0.004 | 0.00089 |
| 599661.78 | 4165616.02 | 0.007731 | 0.004186 | 0.002893 | 0.008 | 0.00155 |
| 599593.85 | 4165593.14 | 0.006738 | 0.003492 | 0.002444 | 0.007 | 0.00135 |
| 600423.04 | 4165950.07 | 0.029206 | 0.014649 | 0.01035 | 0.029 | 0.00584 |
| 600450.99 | 4165951.23 | 0.024854 | 0.012466 | 0.008808 | 0.025 | 0.00497 |
| 600482.43 | 4165952.4 | 0.020882 | 0.010474 | 0.0074 | 0.021 | 0.00418 |
| 600513.87 | 4165944.25 | 0.017711 | 0.008884 | 0.006276 | 0.018 | 0.00354 |
| 600538.32 | 4165900 | 0.016121 | 0.008086 | 0.005713 | 0.016 | 0.00322 |
| 600535.99 | 4165872.05 | 0.016532 | 0.008292 | 0.005859 | 0.017 | 0.00331 |
| 600477.77 | 4165819.66 | 0.019359 | 0.00971 | 0.006861 | 0.019 | 0.00387 |
| 600395.1 | 4165790.55 | 0.022649 | 0.01136 | 0.008026 | 0.023 | 0.00453 |
| 600400.92 | 4165624.03 | 0.008378 | 0.004202 | 0.002969 | 0.008 | 0.00168 |
| 600405.57 | 4165563.49 | 0.005551 | 0.002784 | 0.001967 | 0.006 | 0.00111 |
| 600431.19 | 4165518.07 | 0.004249 | 0.002131 | 0.001506 | 0.004 | 0.00085 |
| 599776.32 | 4165483.21 | 0.003171 | 0.001618 | 0.001138 | 0.003 | 0.00063 |
| 599825.22 | 4165468.07 | 0.002742 | 0.001403 | 0.000986 | 0.003 | 0.00055 |
| 599828.71 | 4165423.82 | 0.002187 | 0.001097 | 0.000775 | 0.002 | 0.00044 |
| 599818.23 | 4165383.07 | 0.001826 | 0.000916 | 0.000647 | 0.002 | 0.00037 |
| 599825.22 | 4165336.49 | 0.001489 | 0.000747 | 0.000528 | 0.001 | 0.00030 |
| 599480.55 | 4165898.91 | 0.018089 | 0.009101 | 0.006424 | 0.018 | 0.00362 |
| 599529.46 | 4165748.7 | 0.012445 | 0.006382 | 0.00448 | 0.012 | 0.00249 |
| 599489.86 | 4165591.5 | 0.005685 | 0.00288 | 0.002029 | 0.006 | 0.00114 |

**Maximum Caner Risk**
0.01
**BAAQMD threshold of significance**
1
**Exceed thresholds?**
No

**Spotorno Ranch**

**No Mitigation**
**at Sensitive Receptors**

**Annual Average PM2.5 (Exhaust + Fugitive Dust)**

| X (m) | Y (m) | 2018 PM2.5 (ug/m3) | 2019 PM2.5 (ug/m3) | 2020 PM2.5 (ug/m3) | Max PM2.5 (ug/m3) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.066257 | 0.033261 | 0.023494 | 0.06626 |
| 599733.16 | 4165874.92 | 0.044533 | 0.022365 | 0.015795 | 0.04453 |
| 599741.25 | 4165874.65 | 0.045645 | 0.022923 | 0.016189 | 0.04564 |
| 599741.25 | 4165858.74 | 0.036905 | 0.018539 | 0.013092 | 0.03690 |
| 599743.41 | 4165868.72 | 0.042234 | 0.021212 | 0.014981 | 0.04223 |
| 599699.19 | 4165884.9 | 0.044528 | 0.022363 | 0.015794 | 0.04453 |
| 599688.4 | 4165885.17 | 0.042643 | 0.021417 | 0.015126 | 0.04264 |
| 599674.38 | 4165884.36 | 0.040316 | 0.02025 | 0.014301 | 0.04032 |
| 599679.23 | 4165849.84 | 0.028769 | 0.014458 | 0.010209 | 0.02877 |
| 599688.13 | 4165850.38 | 0.029369 | 0.014759 | 0.010422 | 0.02937 |
| 599735.05 | 4165820.18 | 0.025384 | 0.01276 | 0.009009 | 0.02538 |
| 599730.2 | 4165813.44 | 0.023934 | 0.012033 | 0.008496 | 0.02393 |
| 599727.23 | 4165806.7 | 0.022744 | 0.011436 | 0.008074 | 0.02274 |
| 599700.27 | 4165802.66 | 0.021151 | 0.010637 | 0.007509 | 0.02115 |
| 599633.92 | 4165882.15 | 0.034926 | 0.017546 | 0.012391 | 0.03493 |
| 599610.98 | 4165795.75 | 0.017938 | 0.009053 | 0.006384 | 0.01794 |
| 599618.85 | 4165755 | 0.014618 | 0.007388 | 0.005208 | 0.01462 |
| 599633.15 | 4165749.99 | 0.014514 | 0.007336 | 0.005171 | 0.01451 |
| 599734.53 | 4165764.17 | 0.018135 | 0.009152 | 0.006454 | 0.01813 |
| 599721.84 | 4165775.36 | 0.018775 | 0.009473 | 0.006681 | 0.01878 |
| 599731.91 | 4165723.49 | 0.014589 | 0.007402 | 0.005212 | 0.01459 |
| 599589.04 | 4166098.06 | 0.012772 | 0.006406 | 0.004526 | 0.01277 |
| 599589.04 | 4166077.92 | 0.018301 | 0.00918 | 0.006486 | 0.01830 |
| 599561.14 | 4166065 | 0.015692 | 0.007871 | 0.005561 | 0.01569 |
| 599693.38 | 4166143.01 | 0.029365 | 0.014729 | 0.010406 | 0.02936 |
| 599756.4 | 4166195.69 | 0.020881 | 0.010474 | 0.0074 | 0.02088 |
| 599715.6 | 4166214.81 | 0.012361 | 0.0062 | 0.004381 | 0.01236 |
| 599593.69 | 4166198.79 | 0.004597 | 0.002306 | 0.001629 | 0.00460 |
| 599813.42 | 4166193.21 | 0.028196 | 0.014143 | 0.009992 | 0.02820 |
| 599855.57 | 4166198.04 | 0.030263 | 0.01518 | 0.010725 | 0.03026 |
| 599993.73 | 4166279.68 | 0.015509 | 0.007779 | 0.005496 | 0.01551 |
| 599986.85 | 4166279.22 | 0.015514 | 0.007782 | 0.005498 | 0.01551 |
| 599994.19 | 4166267.07 | 0.017132 | 0.008593 | 0.006071 | 0.01713 |
| 599805.61 | 4166278.22 | 0.011375 | 0.005706 | 0.004031 | 0.01138 |
| 599653.74 | 4166315.93 | 0.003954 | 0.001983 | 0.001401 | 0.00395 |
| 599693 | 4166325.23 | 0.004752 | 0.002384 | 0.001684 | 0.00475 |
| 599682.15 | 4166339.17 | 0.004165 | 0.002089 | 0.001476 | 0.00417 |
| 599657.87 | 4166284.42 | 0.004722 | 0.002369 | 0.001673 | 0.00472 |
| 599664.07 | 4166261.69 | 0.005609 | 0.002814 | 0.001988 | 0.00561 |
| 599718.31 | 4166304.56 | 0.006153 | 0.003086 | 0.00218 | 0.00615 |
| 599643.92 | 4166338.66 | 0.003406 | 0.001708 | 0.001207 | 0.00341 |
| 599749.31 | 4166342.79 | 0.005621 | 0.002819 | 0.001992 | 0.00562 |
| 599773.58 | 4166308.18 | 0.007834 | 0.003929 | 0.002776 | 0.00783 |
| 599787.53 | 4166296.81 | 0.00906 | 0.004544 | 0.003211 | 0.00906 |
| 599439.45 | 4166224.05 | 0.001962 | 0.000984 | 0.000695 | 0.00196 |
| 599416.62 | 4166137.54 | 0.002753 | 0.001381 | 0.000975 | 0.00275 |
| 599424.09 | 4166124.37 | 0.003153 | 0.001582 | 0.001117 | 0.00315 |
| 599429.36 | 4166143.69 | 0.002788 | 0.001399 | 0.000988 | 0.00279 |
| 599458.78 | 4166272.79 | 0.00179 | 0.000898 | 0.000634 | 0.00179 |
| 599538.7 | 4166310.99 | 0.002248 | 0.001127 | 0.000797 | 0.00225 |
| 599565.92 | 4166311.87 | 0.002511 | 0.00126 | 0.00089 | 0.00251 |
| 599348.53 | 4166130.26 | 0.002375 | 0.001191 | 0.000842 | 0.00238 |
| 599383.18 | 4166205.02 | 0.00172 | 0.000863 | 0.00061 | 0.00172 |
| 599364.34 | 4166167.94 | 0.001963 | 0.000985 | 0.000696 | 0.00196 |
| 599485.89 | 4166401.33 | 0.001533 | 0.000769 | 0.000543 | 0.00153 |
| 599574.63 | 4166367.9 | 0.002217 | 0.001112 | 0.000786 | 0.00222 |
| 599591.04 | 4166409.84 | 0.002138 | 0.001072 | 0.000758 | 0.00214 |
| 600138.3 | 4165809.31 | 0.072256 | 0.036271 | 0.02562 | 0.07226 |
| 600116.85 | 4165800.73 | 0.07049 | 0.035413 | 0.025008 | 0.07049 |
| 600084.67 | 4165785 | 0.061463 | 0.030941 | 0.021837 | 0.06146 |
| 600042.49 | 4165762.11 | 0.043538 | 0.022034 | 0.015526 | 0.04354 |
| 600006.02 | 4165743.52 | 0.02689 | 0.013712 | 0.00964 | 0.02689 |
| 599955.96 | 4165699.9 | 0.014769 | 0.007548 | 0.005303 | 0.01477 |
| 599899.58 | 4165667.19 | 0.010997 | 0.005656 | 0.003967 | 0.01100 |
| 599879.52 | 4165617.35 | 0.007219 | 0.003705 | 0.0026 | 0.00722 |
| 599739.82 | 4165597.07 | 0.006894 | 0.00357 | 0.002499 | 0.00689 |
| 599821.24 | 4165543.08 | 0.004469 | 0.00227 | 0.001598 | 0.00447 |
| 599661.78 | 4165616.02 | 0.007731 | 0.004186 | 0.002893 | 0.00773 |
| 599593.85 | 4165593.14 | 0.006738 | 0.003492 | 0.002444 | 0.00674 |
| 600423.04 | 4165950.07 | 0.029206 | 0.014649 | 0.01035 | 0.02921 |
| 600450.99 | 4165951.23 | 0.024854 | 0.012466 | 0.008808 | 0.02485 |
| 600482.43 | 4165952.4 | 0.020882 | 0.010474 | 0.0074 | 0.02088 |
| 600513.87 | 4165944.25 | 0.017711 | 0.008884 | 0.006276 | 0.01771 |
| 600538.32 | 4165900 | 0.016121 | 0.008086 | 0.005713 | 0.01612 |
| 600535.99 | 4165872.05 | 0.016532 | 0.008292 | 0.005859 | 0.01653 |
| 600477.77 | 4165819.66 | 0.019359 | 0.00971 | 0.006861 | 0.01936 |
| 600395.1 | 4165790.55 | 0.022649 | 0.01136 | 0.008026 | 0.02265 |
| 600400.92 | 4165624.03 | 0.008378 | 0.004202 | 0.002969 | 0.00838 |
| 600405.57 | 4165563.49 | 0.005551 | 0.002784 | 0.001967 | 0.00555 |
| 600431.19 | 4165518.07 | 0.004249 | 0.002131 | 0.001506 | 0.00425 |
| 599776.32 | 4165483.21 | 0.003171 | 0.001618 | 0.001138 | 0.00317 |
| 599825.22 | 4165468.07 | 0.002742 | 0.001403 | 0.000986 | 0.00274 |
| 599828.71 | 4165423.82 | 0.002187 | 0.001097 | 0.000775 | 0.00219 |
| 599818.23 | 4165383.07 | 0.001826 | 0.000916 | 0.000647 | 0.00183 |
| 599825.22 | 4165336.49 | 0.001489 | 0.000747 | 0.000528 | 0.00149 |
| 599480.55 | 4165898.91 | 0.018089 | 0.009101 | 0.006424 | 0.01809 |
| 599529.46 | 4165748.7 | 0.012445 | 0.006382 | 0.00448 | 0.01245 |
| 599489.86 | 4165591.5 | 0.005685 | 0.00288 | 0.002029 | 0.00569 |

**Maximum Caner Risk**
0.1
**BAAQMD threshold of significance**
0.3
**Exceed thresholds?**
No

## Spotorno Ranch

**Tier III Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

| **Construction Scheduling** | **2018** | | |
|---|---|---|---|
| | 8 | hours/day | |
| | 5 | days/week | |
| | 13 | weeks/year | *start from 10/1/2018 |
| | 520 | hours/year | |

**Onsite Construction Area Source Size (m2):** 130146.8 from AERMOD

**Onsite Construction PM2.5 Emissions**

| **2018** | **Construction Activity** | **Onsite Annual DPM Exhaust Emissions (tons/year)** | **Onsite Annual DPM Exhaust Emissions (g/sec)** | **Onsite DPM Source Exhaust Emissions (g/m2-sec)** |
|---|---|---|---|---|
| | Site Preparation | 9.460E-03 | 4.589E-03 | 3.526E-08 |
| | Grading | 2.920E-02 | 1.416E-02 | 1.088E-07 |
| | Building Construction | 4.600E-04 | 2.231E-04 | 1.714E-09 |
| | | | | |
| | **Total** | **3.912E-02** | **1.897E-02** | **1.458E-07** |

**Offsite Construction Vehicle PM2.5 Emissions**

| **2018** | **Construction Activity** | **Offsite Hauling Annual DPM Exhaust Emissions (tons/year)** | **Offsite Vendor Annual DPM Exhaust Emissions (tons/year)** | **Offsite Workers Annual DPM Exhaust Emissions (tons/year)** | |
|---|---|---|---|---|---|
| | Site Preparation | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | Grading | 0.000E+00 | 0.000E+00 | 2.000E-05 | |
| | Building Construction | 0.000E+00 | 1.000E-05 | 0.000E+00 | |
| | 0 | | | | |
| | **Total (tons/year)** | **0.000E+00** | **1.000E-05** | **3.000E-05** | **4.000E-05** |
| | **Trip Distance assumed in CalEEMod (mi)** | 20.0 | 7.3 | 10.8 | |
| | **Offsite Project Trip Distance Along Roadway Segment** Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions Along Roadway Segment** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **7.344E-07** | **1.489E-06** | |

| **Offsite Emissions Along Roadway Segment Analyzed** | |
|---|---|
| **Total Offsite Project Exhaust Emissions (tons/year)** | **2.224E-06** |
| **Total Offsite Project Exhaust Emissions (grams/sec)** | **1.079E-06** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **3.912E-02** |
| **Total Onsite Emissions (tons/year)** | **3.912E-02** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **1.458E-07** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 3.912E-02 |

## Spotorno Ranch

**Tier III Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Construction Scheduling** **2019**

| | |
|---|---|
| 8 | hours/day |
| 5 | days/week |
| 52 | weeks/year |
| 2080 | hours/year |

**Onsite Construction Area Source Size (m2):** 130146.80

**Onsite Construction PM2.5 Emissions**

| 2019 | Construction Activity | Onsite Annual DPM Exhaust Emissions (tons/year) | Onsite Annual DPM Exhaust Emissions (g/sec) | Onsite DPM Source Exhaust Emissions (g/m2-sec) |
|---|---|---|---|---|
| | Building Construction | 1.176E-01 | 1.426E-02 | 1.096E-07 |
| | | | | |
| | | | | |
| | **Total** | **1.176E-01** | **1.426E-02** | **1.096E-07** |

**Offsite Construction Vehicle PM2.5 Emissions**

| 2019 | Construction Activity | Offsite Hauling Annual DPM Exhaust Emissions (tons/year) | Offsite Vendor Annual DPM Exhaust Emissions (tons/year) | Offsite Workers Annual DPM Exhaust Emissions (tons/year) | |
|---|---|---|---|---|---|
| | Building Construction | 0.000E+00 | 2.860E-03 | 5.100E-04 | |
| | 0 | | | | |
| | 0 | | | | |
| | **Total (tons/year)** | **0.000E+00** | **2.860E-03** | **5.100E-04** | **3.370E-03** |
| | Trip Distance assumed in CalEEMod (mi) | 20.0 | 7.3 | 10.8 | |
| | Offsite Project Trip Distance Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **2.100E-04** | **2.532E-05** | |

| | |
|---|---|
| **Emissions Along Roadway Segment** | |
| **Offsite Project Exhaust Emissions (tons/year)** | **2.354E-04** |
| **Offsite Project Exhaust Emissions (grams/sec)** | **2.854E-05** |
| **Offsite Project Fugitive Emissions (tons/year)** | **0.000E+00** |
| **Offsite Project Fugitive Emissions (grams/sec)** | **0.000E+00** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **1.176E-01** |
| **Total Onsite Emissions (tons/year)** | **1.176E-01** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **1.096E-07** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 1.178E-01 |
| **Total PM2.5 (tons/year)** | **1.178E-01** |

## Spotorno Ranch

**Tier III Mitigation**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

| **Construction Scheduling** | **2020** | |
|---|---|---|
| | 8 hours/day | |
| | 5 days/week | **end at December 11, 2020 |
| | 50 weeks/year | |
| | 2000 hours/year | |

**Onsite Construction Area Source Size (m2):** 130146.80

**Onsite Construction PM2.5 Emissions**

| **2020** | **Construction Activity** | **Onsite Annual DPM Exhaust Emissions (tons/year)** | **Onsite Annual DPM Exhaust Emissions (g/sec)** | **Onsite DPM Source Exhaust Emissions (g/m2-sec)** |
|---|---|---|---|---|
| | Building Construction | 7.910E-02 | 9.975E-03 | 7.665E-08 |
| | Paving | 1.070E-02 | 1.349E-03 | 1.037E-08 |
| | Architectural Coating | 1.660E-03 | 2.093E-04 | 1.609E-09 |
| | **Total** | **9.146E-02** | **1.153E-02** | **8.862E-08** |

**Offsite Construction Vehicle PM2.5 Emissions**

| **2020** | **Construction Activity** | **Offsite Hauling Annual DPM Exhaust Emissions (tons/year)** | **Offsite Vendor Annual DPM Exhaust Emissions (tons/year)** | **Offsite Workers Annual DPM Exhaust Emissions (tons/year)** | |
|---|---|---|---|---|---|
| | Building Construction | 0.000E+00 | 1.300E-03 | 3.400E-04 | |
| | Paving | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | Architectural Coating | 0.000E+00 | 0.000E+00 | 1.000E-05 | |
| | **Total (tons/year)** | **0.000E+00** | **1.300E-03** | **3.600E-04** | **1.660E-03** |
| | Trip Distance assumed in CalEEMod (mi) | 20.0 | 7.3 | 10.8 | |
| | Offsite Project Trip Distance Project>Westbridge Lane>US680 (mi) | 0.54 | 0.54 | 0.54 | |
| | **Offsite Project Emissions** Project>Westbridge Lane>US680 (tons/year) | **0.000E+00** | **9.547E-05** | **1.787E-05** | |

| | |
|---|---|
| **Emissions Along Roadway Segment** | |
| **Offsite Project Exhaust Emissions (tons/year)** | **1.133E-04** |
| **Offsite Project Exhaust Emissions (grams/sec)** | **1.429E-05** |
| **Offsite Project Fugitive Emissions (tons/year)** | **0.000E+00** |
| **Offsite Project Fugitive Emissions (grams/sec)** | **0.000E+00** |

| | |
|---|---|
| **Onsite Exhaust Emissions (tons/year)** | **9.146E-02** |
| **Total Onsite Emissions (tons/year)** | **9.146E-02** |
| **Onsite Exhaust Emissions (g/m2-sec)** | **8.862E-08** |

| | |
|---|---|
| **Total PM@2.5 Exhaust (tons/year)** | 9.157E-02 |
| **Total PM2.5 (tons/year)** | **9.157E-02** |

# Spotorno Ranch

**2018** **Tier III Mitigation** **At Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 1.45796E-07
**Annual Average Offsite DPM Exhaust Emission Rate:** 1.07853E-06

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.03285 | 0.00001 | 1.07853E-06 | 0.03285 |
| 599733.16 | 4165874.92 | 1.51441 | 0.02208 | 0.00001 | 1.07853E-06 | 0.02208 |
| 599741.25 | 4165874.65 | 1.55224 | 0.02263 | 0.00001 | 1.07853E-06 | 0.02263 |
| 599741.25 | 4165858.74 | 1.25501 | 0.01830 | 0.00001 | 1.07853E-06 | 0.01830 |
| 599743.41 | 4165868.72 | 1.43625 | 0.02094 | 0.00001 | 1.07853E-06 | 0.02094 |
| 599699.19 | 4165884.9 | 1.51426 | 0.02208 | 0.00001 | 1.07853E-06 | 0.02208 |
| 599688.4 | 4165885.17 | 1.45014 | 0.02114 | 0.00001 | 1.07853E-06 | 0.02114 |
| 599674.38 | 4165884.36 | 1.37101 | 0.01999 | 0.00001 | 1.07853E-06 | 0.01999 |
| 599679.23 | 4165849.84 | 0.97833 | 0.01426 | 0.00001 | 1.07853E-06 | 0.01426 |
| 599688.13 | 4165850.38 | 0.99875 | 0.01456 | 0.00001 | 1.07853E-06 | 0.01456 |
| 599735.05 | 4165820.18 | 0.86321 | 0.01259 | 0.00001 | 1.07853E-06 | 0.01259 |
| 599730.2 | 4165813.44 | 0.8139 | 0.01187 | 0.00001 | 1.07853E-06 | 0.01187 |
| 599727.23 | 4165806.7 | 0.77342 | 0.01128 | 0.00001 | 1.07853E-06 | 0.01128 |
| 599700.27 | 4165802.66 | 0.71926 | 0.01049 | 0.00001 | 1.07853E-06 | 0.01049 |
| 599633.92 | 4165882.15 | 1.18771 | 0.01732 | 0.00001 | 1.07853E-06 | 0.01732 |
| 599610.98 | 4165795.75 | 0.60994 | 0.00889 | 0.00002 | 2.15706E-06 | 0.00889 |
| 599618.85 | 4165755 | 0.49706 | 0.00725 | 0.00002 | 2.15706E-06 | 0.00725 |
| 599633.15 | 4165749.99 | 0.49351 | 0.00720 | 0.00002 | 2.15706E-06 | 0.00720 |
| 599734.53 | 4165764.17 | 0.61664 | 0.00899 | 0.00002 | 2.15706E-06 | 0.00899 |
| 599721.84 | 4165775.36 | 0.63843 | 0.00931 | 0.00002 | 2.15706E-06 | 0.00931 |
| 599731.91 | 4165723.49 | 0.49603 | 0.00723 | 0.00003 | 3.23559E-06 | 0.00724 |
| 599589.04 | 4166098.06 | 0.43435 | 0.00633 | 0.00000 | 0.00000E+00 | 0.00633 |
| 599589.04 | 4166077.92 | 0.62239 | 0.00907 | 0.00000 | 0.00000E+00 | 0.00907 |
| 599561.14 | 4166065 | 0.53365 | 0.00778 | 0.00000 | 0.00000E+00 | 0.00778 |
| 599693.38 | 4166143.01 | 0.99863 | 0.01456 | 0.00000 | 0.00000E+00 | 0.01456 |
| 599756.4 | 4166195.69 | 0.71013 | 0.01035 | 0.00000 | 0.00000E+00 | 0.01035 |
| 599715.6 | 4166214.81 | 0.42038 | 0.00613 | 0.00000 | 0.00000E+00 | 0.00613 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00228 | 0.00000 | 0.00000E+00 | 0.00228 |
| 599813.42 | 4166193.21 | 0.95887 | 0.01398 | 0.00000 | 0.00000E+00 | 0.01398 |
| 599855.57 | 4166198.04 | 1.02919 | 0.01501 | 0.00000 | 0.00000E+00 | 0.01501 |
| 599993.73 | 4166279.68 | 0.52742 | 0.00769 | 0.00000 | 0.00000E+00 | 0.00769 |
| 599986.85 | 4166279.22 | 0.5276 | 0.00769 | 0.00000 | 0.00000E+00 | 0.00769 |
| 599994.19 | 4166267.07 | 0.58263 | 0.00849 | 0.00000 | 0.00000E+00 | 0.00849 |
| 599805.61 | 4166278.22 | 0.38684 | 0.00564 | 0.00000 | 0.00000E+00 | 0.00564 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00196 | 0.00000 | 0.00000E+00 | 0.00196 |
| 599693 | 4166325.23 | 0.16162 | 0.00236 | 0.00000 | 0.00000E+00 | 0.00236 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00207 | 0.00000 | 0.00000E+00 | 0.00207 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00234 | 0.00000 | 0.00000E+00 | 0.00234 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00278 | 0.00000 | 0.00000E+00 | 0.00278 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00305 | 0.00000 | 0.00000E+00 | 0.00305 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00169 | 0.00000 | 0.00000E+00 | 0.00169 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00279 | 0.00000 | 0.00000E+00 | 0.00279 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00388 | 0.00000 | 0.00000E+00 | 0.00388 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00449 | 0.00000 | 0.00000E+00 | 0.00449 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00097 | 0.00000 | 0.00000E+00 | 0.00097 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00136 | 0.00000 | 0.00000E+00 | 0.00136 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00156 | 0.00000 | 0.00000E+00 | 0.00156 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00138 | 0.00000 | 0.00000E+00 | 0.00138 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00089 | 0.00000 | 0.00000E+00 | 0.00089 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00111 | 0.00000 | 0.00000E+00 | 0.00111 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00125 | 0.00000 | 0.00000E+00 | 0.00125 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00118 | 0.00000 | 0.00000E+00 | 0.00118 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00085 | 0.00000 | 0.00000E+00 | 0.00085 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00097 | 0.00000 | 0.00000E+00 | 0.00097 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00076 | 0.00000 | 0.00000E+00 | 0.00076 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00110 | 0.00000 | 0.00000E+00 | 0.00110 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00106 | 0.00000 | 0.00000E+00 | 0.00106 |
| 600138.3 | 4165809.31 | 2.45723 | 0.03583 | 0.00001 | 1.07853E-06 | 0.03583 |
| 600116.85 | 4165800.73 | 2.39714 | 0.03495 | 0.00002 | 2.15706E-06 | 0.03495 |
| 600084.67 | 4165785 | 2.09007 | 0.03047 | 0.00004 | 4.31412E-06 | 0.03048 |
| 600042.49 | 4165762.11 | 1.48036 | 0.02158 | 0.00007 | 7.54970E-06 | 0.02159 |
| 600006.02 | 4165743.52 | 0.91417 | 0.01333 | 0.00008 | 8.62823E-06 | 0.01334 |
| 599955.96 | 4165699.9 | 0.50206 | 0.00732 | 0.00005 | 5.39265E-06 | 0.00733 |
| 599899.58 | 4165667.19 | 0.37379 | 0.00545 | 0.00005 | 5.39265E-06 | 0.00546 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00358 | 0.00003 | 3.23559E-06 | 0.00358 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00342 | 0.00004 | 4.31412E-06 | 0.00342 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00222 | 0.00001 | 1.07853E-06 | 0.00222 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00383 | 0.00011 | 1.18638E-05 | 0.00384 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00334 | 0.00004 | 4.31412E-06 | 0.00334 |
| 600423.04 | 4165950.07 | 0.99324 | 0.01448 | 0.00000 | 0.00000E+00 | 0.01448 |
| 600450.99 | 4165951.23 | 0.84523 | 0.01232 | 0.00000 | 0.00000E+00 | 0.01232 |
| 600482.43 | 4165952.4 | 0.71015 | 0.01035 | 0.00000 | 0.00000E+00 | 0.01035 |
| 600513.87 | 4165944.25 | 0.60232 | 0.00878 | 0.00000 | 0.00000E+00 | 0.00878 |
| 600538.32 | 4165900 | 0.54825 | 0.00799 | 0.00000 | 0.00000E+00 | 0.00799 |
| 600535.99 | 4165872.05 | 0.56223 | 0.00820 | 0.00000 | 0.00000E+00 | 0.00820 |
| 600477.77 | 4165819.66 | 0.65837 | 0.00960 | 0.00000 | 0.00000E+00 | 0.00960 |
| 600395.1 | 4165790.55 | 0.77024 | 0.01123 | 0.00000 | 0.00000E+00 | 0.01123 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00415 | 0.00000 | 0.00000E+00 | 0.00415 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00275 | 0.00000 | 0.00000E+00 | 0.00275 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00211 | 0.00000 | 0.00000E+00 | 0.00211 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00157 | 0.00001 | 1.07853E-06 | 0.00157 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00136 | 0.00001 | 1.07853E-06 | 0.00136 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00108 | 0.00000 | 0.00000E+00 | 0.00108 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00091 | 0.00000 | 0.00000E+00 | 0.00091 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00074 | 0.00000 | 0.00000E+00 | 0.00074 |
| 599480.55 | 4165898.91 | 0.61514 | 0.00897 | 0.00001 | 1.07853E-06 | 0.00897 |
| 599529.46 | 4165748.7 | 0.42305 | 0.00617 | 0.00005 | 5.39265E-06 | 0.00617 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00282 | 0.00001 | 1.07853E-06 | 0.00282 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

**Spotorno Ranch** **2019** **Tier III Mitigation** **at Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 1.09571E-07 grams/m2/sec

**Annual Average Offsite DPM Exhaust Emission Rate:** 2.85390E-05 grams/sec

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.02469 | 0.00001 | 2.85390E-05 | 0.02472 |
| 599733.16 | 4165874.92 | 1.51441 | 0.01659 | 0.00001 | 2.85390E-05 | 0.01662 |
| 599741.25 | 4165874.65 | 1.55224 | 0.01701 | 0.00001 | 2.85390E-05 | 0.01704 |
| 599741.25 | 4165858.74 | 1.25501 | 0.01375 | 0.00001 | 2.85390E-05 | 0.01378 |
| 599743.41 | 4165868.72 | 1.43625 | 0.01574 | 0.00001 | 2.85390E-05 | 0.01577 |
| 599699.19 | 4165884.9 | 1.51426 | 0.01659 | 0.00001 | 2.85390E-05 | 0.01662 |
| 599688.4 | 4165885.17 | 1.45014 | 0.01589 | 0.00001 | 2.85390E-05 | 0.01592 |
| 599674.38 | 4165884.36 | 1.37101 | 0.01502 | 0.00001 | 2.85390E-05 | 0.01505 |
| 599679.23 | 4165849.84 | 0.97833 | 0.01072 | 0.00001 | 2.85390E-05 | 0.01075 |
| 599688.13 | 4165850.38 | 0.99875 | 0.01094 | 0.00001 | 2.85390E-05 | 0.01097 |
| 599735.05 | 4165820.18 | 0.86321 | 0.00946 | 0.00001 | 2.85390E-05 | 0.00949 |
| 599730.2 | 4165813.44 | 0.8139 | 0.00892 | 0.00001 | 2.85390E-05 | 0.00895 |
| 599727.23 | 4165806.7 | 0.77342 | 0.00847 | 0.00001 | 2.85390E-05 | 0.00850 |
| 599700.27 | 4165802.66 | 0.71926 | 0.00788 | 0.00001 | 2.85390E-05 | 0.00791 |
| 599633.92 | 4165882.15 | 1.18771 | 0.01301 | 0.00001 | 2.85390E-05 | 0.01304 |
| 599610.98 | 4165795.75 | 0.60994 | 0.00668 | 0.00002 | 5.70779E-05 | 0.00674 |
| 599618.85 | 4165755 | 0.49706 | 0.00545 | 0.00002 | 5.70779E-05 | 0.00550 |
| 599633.15 | 4165749.99 | 0.49351 | 0.00541 | 0.00002 | 5.70779E-05 | 0.00546 |
| 599734.53 | 4165764.17 | 0.61664 | 0.00676 | 0.00002 | 5.70779E-05 | 0.00681 |
| 599721.84 | 4165775.36 | 0.63843 | 0.00700 | 0.00002 | 5.70779E-05 | 0.00705 |
| 599731.91 | 4165723.49 | 0.49603 | 0.00544 | 0.00003 | 8.56169E-05 | 0.00552 |
| 599589.04 | 4166098.06 | 0.43435 | 0.00476 | 0.00000 | 0.00000E+00 | 0.00476 |
| 599589.04 | 4166077.92 | 0.62239 | 0.00682 | 0.00000 | 0.00000E+00 | 0.00682 |
| 599561.14 | 4166065 | 0.53365 | 0.00585 | 0.00000 | 0.00000E+00 | 0.00585 |
| 599693.38 | 4166143.01 | 0.99863 | 0.01094 | 0.00000 | 0.00000E+00 | 0.01094 |
| 599756.4 | 4166195.69 | 0.71013 | 0.00778 | 0.00000 | 0.00000E+00 | 0.00778 |
| 599715.6 | 4166214.81 | 0.42038 | 0.00461 | 0.00000 | 0.00000E+00 | 0.00461 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00171 | 0.00000 | 0.00000E+00 | 0.00171 |
| 599813.42 | 4166193.21 | 0.95887 | 0.01051 | 0.00000 | 0.00000E+00 | 0.01051 |
| 599855.57 | 4166198.04 | 1.02919 | 0.01128 | 0.00000 | 0.00000E+00 | 0.01128 |
| 599993.73 | 4166279.68 | 0.52742 | 0.00578 | 0.00000 | 0.00000E+00 | 0.00578 |
| 599986.85 | 4166279.22 | 0.5276 | 0.00578 | 0.00000 | 0.00000E+00 | 0.00578 |
| 599994.19 | 4166267.07 | 0.58263 | 0.00638 | 0.00000 | 0.00000E+00 | 0.00638 |
| 599805.61 | 4166278.22 | 0.38684 | 0.00424 | 0.00000 | 0.00000E+00 | 0.00424 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00147 | 0.00000 | 0.00000E+00 | 0.00147 |
| 599693 | 4166325.23 | 0.16162 | 0.00177 | 0.00000 | 0.00000E+00 | 0.00177 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00155 | 0.00000 | 0.00000E+00 | 0.00155 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00176 | 0.00000 | 0.00000E+00 | 0.00176 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00209 | 0.00000 | 0.00000E+00 | 0.00209 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00229 | 0.00000 | 0.00000E+00 | 0.00229 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00127 | 0.00000 | 0.00000E+00 | 0.00127 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00209 | 0.00000 | 0.00000E+00 | 0.00209 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00292 | 0.00000 | 0.00000E+00 | 0.00292 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00338 | 0.00000 | 0.00000E+00 | 0.00338 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00073 | 0.00000 | 0.00000E+00 | 0.00073 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00103 | 0.00000 | 0.00000E+00 | 0.00103 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00118 | 0.00000 | 0.00000E+00 | 0.00118 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00104 | 0.00000 | 0.00000E+00 | 0.00104 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00067 | 0.00000 | 0.00000E+00 | 0.00067 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00084 | 0.00000 | 0.00000E+00 | 0.00084 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00094 | 0.00000 | 0.00000E+00 | 0.00094 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00089 | 0.00000 | 0.00000E+00 | 0.00089 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00064 | 0.00000 | 0.00000E+00 | 0.00064 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00073 | 0.00000 | 0.00000E+00 | 0.00073 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00057 | 0.00000 | 0.00000E+00 | 0.00057 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00083 | 0.00000 | 0.00000E+00 | 0.00083 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00080 | 0.00000 | 0.00000E+00 | 0.00080 |
| 600138.3 | 4165809.31 | 2.45723 | 0.02692 | 0.00001 | 2.85390E-05 | 0.02695 |
| 600116.85 | 4165800.73 | 2.39714 | 0.02627 | 0.00002 | 5.70779E-05 | 0.02632 |
| 600084.67 | 4165785 | 2.09007 | 0.02290 | 0.00004 | 1.14156E-04 | 0.02302 |
| 600042.49 | 4165762.11 | 1.48036 | 0.01622 | 0.00007 | 1.99773E-04 | 0.01642 |
| 600006.02 | 4165743.52 | 0.91417 | 0.01002 | 0.00008 | 2.28312E-04 | 0.01024 |
| 599955.96 | 4165699.9 | 0.50206 | 0.00550 | 0.00005 | 1.42695E-04 | 0.00564 |
| 599899.58 | 4165667.19 | 0.37379 | 0.00410 | 0.00005 | 1.42695E-04 | 0.00424 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00269 | 0.00003 | 8.56169E-05 | 0.00277 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00257 | 0.00004 | 1.14156E-04 | 0.00268 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00166 | 0.00001 | 2.85390E-05 | 0.00169 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00288 | 0.00011 | 3.13929E-04 | 0.00319 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00251 | 0.00004 | 1.14156E-04 | 0.00262 |
| 600423.04 | 4165950.07 | 0.99324 | 0.01088 | 0.00000 | 0.00000E+00 | 0.01088 |
| 600450.99 | 4165951.23 | 0.84523 | 0.00926 | 0.00000 | 0.00000E+00 | 0.00926 |
| 600482.43 | 4165952.4 | 0.71015 | 0.00778 | 0.00000 | 0.00000E+00 | 0.00778 |
| 600513.87 | 4165944.25 | 0.60232 | 0.00660 | 0.00000 | 0.00000E+00 | 0.00660 |
| 600538.32 | 4165900 | 0.54825 | 0.00601 | 0.00000 | 0.00000E+00 | 0.00601 |
| 600535.99 | 4165872.05 | 0.56223 | 0.00616 | 0.00000 | 0.00000E+00 | 0.00616 |
| 600477.77 | 4165819.66 | 0.65837 | 0.00721 | 0.00000 | 0.00000E+00 | 0.00721 |
| 600395.1 | 4165790.55 | 0.77024 | 0.00844 | 0.00000 | 0.00000E+00 | 0.00844 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00312 | 0.00000 | 0.00000E+00 | 0.00312 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00207 | 0.00000 | 0.00000E+00 | 0.00207 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00158 | 0.00000 | 0.00000E+00 | 0.00158 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00118 | 0.00001 | 2.85390E-05 | 0.00121 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00102 | 0.00001 | 2.85390E-05 | 0.00105 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00082 | 0.00000 | 0.00000E+00 | 0.00082 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00068 | 0.00000 | 0.00000E+00 | 0.00068 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00055 | 0.00000 | 0.00000E+00 | 0.00055 |
| 599480.55 | 4165898.91 | 0.61514 | 0.00674 | 0.00001 | 2.85390E-05 | 0.00677 |
| 599529.46 | 4165748.7 | 0.42305 | 0.00464 | 0.00005 | 1.42695E-04 | 0.00478 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00212 | 0.00001 | 2.85390E-05 | 0.00215 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

**Spotorno Ranch** **2020** **Tier III Mitigation** **at Sensitive Receptors**

**Construction Annual DPM Emissions ( as PM2.5 Exhaust)**

**Annual Average Onsite DPM Exhaust Emission Rate:** 8.86239E-08 grams/m2/sec

**Annual Average Offsite DPM Exhaust Emission Rate:** 1.42936E-05 grams/sec

| X (m) | Y (m) | Onsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Onsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Unit Emissions (ug/m3) | Offsite Annual DPM Exhaust w/Actual Emissions (ug/m3) | Total DPM (ug/m3) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 2.2532 | 0.01997 | 0.00001 | 1.42936E-05 | 0.01998 |
| 599733.16 | 4165874.92 | 1.51441 | 0.01342 | 0.00001 | 1.42936E-05 | 0.01344 |
| 599741.25 | 4165874.65 | 1.55224 | 0.01376 | 0.00001 | 1.42936E-05 | 0.01377 |
| 599741.25 | 4165858.74 | 1.25501 | 0.01112 | 0.00001 | 1.42936E-05 | 0.01114 |
| 599743.41 | 4165868.72 | 1.43625 | 0.01273 | 0.00001 | 1.42936E-05 | 0.01274 |
| 599699.19 | 4165884.9 | 1.51426 | 0.01342 | 0.00001 | 1.42936E-05 | 0.01343 |
| 599688.4 | 4165885.17 | 1.45014 | 0.01285 | 0.00001 | 1.42936E-05 | 0.01287 |
| 599674.38 | 4165884.36 | 1.37101 | 0.01215 | 0.00001 | 1.42936E-05 | 0.01216 |
| 599679.23 | 4165849.84 | 0.97833 | 0.00867 | 0.00001 | 1.42936E-05 | 0.00868 |
| 599688.13 | 4165850.38 | 0.99875 | 0.00885 | 0.00001 | 1.42936E-05 | 0.00887 |
| 599735.05 | 4165820.18 | 0.86321 | 0.00765 | 0.00001 | 1.42936E-05 | 0.00766 |
| 599730.2 | 4165813.44 | 0.8139 | 0.00721 | 0.00001 | 1.42936E-05 | 0.00723 |
| 599727.23 | 4165806.7 | 0.77342 | 0.00685 | 0.00001 | 1.42936E-05 | 0.00687 |
| 599700.27 | 4165802.66 | 0.71926 | 0.00637 | 0.00001 | 1.42936E-05 | 0.00639 |
| 599633.92 | 4165882.15 | 1.18771 | 0.01053 | 0.00001 | 1.42936E-05 | 0.01054 |
| 599610.98 | 4165795.75 | 0.60994 | 0.00541 | 0.00002 | 2.85872E-05 | 0.00543 |
| 599618.85 | 4165755 | 0.49706 | 0.00441 | 0.00002 | 2.85872E-05 | 0.00443 |
| 599633.15 | 4165749.99 | 0.49351 | 0.00437 | 0.00002 | 2.85872E-05 | 0.00440 |
| 599734.53 | 4165764.17 | 0.61664 | 0.00546 | 0.00002 | 2.85872E-05 | 0.00549 |
| 599721.84 | 4165775.36 | 0.63843 | 0.00566 | 0.00002 | 2.85872E-05 | 0.00569 |
| 599731.91 | 4165723.49 | 0.49603 | 0.00440 | 0.00003 | 4.28807E-05 | 0.00444 |
| 599589.04 | 4166098.06 | 0.43435 | 0.00385 | 0.00000 | 0.00000E+00 | 0.00385 |
| 599589.04 | 4166077.92 | 0.62239 | 0.00552 | 0.00000 | 0.00000E+00 | 0.00552 |
| 599561.14 | 4166065 | 0.53365 | 0.00473 | 0.00000 | 0.00000E+00 | 0.00473 |
| 599693.38 | 4166143.01 | 0.99863 | 0.00885 | 0.00000 | 0.00000E+00 | 0.00885 |
| 599756.4 | 4166195.69 | 0.71013 | 0.00629 | 0.00000 | 0.00000E+00 | 0.00629 |
| 599715.6 | 4166214.81 | 0.42038 | 0.00373 | 0.00000 | 0.00000E+00 | 0.00373 |
| 599593.69 | 4166198.79 | 0.15635 | 0.00139 | 0.00000 | 0.00000E+00 | 0.00139 |
| 599813.42 | 4166193.21 | 0.95887 | 0.00850 | 0.00000 | 0.00000E+00 | 0.00850 |
| 599855.57 | 4166198.04 | 1.02919 | 0.00912 | 0.00000 | 0.00000E+00 | 0.00912 |
| 599993.73 | 4166279.68 | 0.52742 | 0.00467 | 0.00000 | 0.00000E+00 | 0.00467 |
| 599986.85 | 4166279.22 | 0.5276 | 0.00468 | 0.00000 | 0.00000E+00 | 0.00468 |
| 599994.19 | 4166267.07 | 0.58263 | 0.00516 | 0.00000 | 0.00000E+00 | 0.00516 |
| 599805.61 | 4166278.22 | 0.38684 | 0.00343 | 0.00000 | 0.00000E+00 | 0.00343 |
| 599653.74 | 4166315.93 | 0.13446 | 0.00119 | 0.00000 | 0.00000E+00 | 0.00119 |
| 599693 | 4166325.23 | 0.16162 | 0.00143 | 0.00000 | 0.00000E+00 | 0.00143 |
| 599682.15 | 4166339.17 | 0.14165 | 0.00126 | 0.00000 | 0.00000E+00 | 0.00126 |
| 599657.87 | 4166284.42 | 0.16059 | 0.00142 | 0.00000 | 0.00000E+00 | 0.00142 |
| 599664.07 | 4166261.69 | 0.19076 | 0.00169 | 0.00000 | 0.00000E+00 | 0.00169 |
| 599718.31 | 4166304.56 | 0.20924 | 0.00185 | 0.00000 | 0.00000E+00 | 0.00185 |
| 599643.92 | 4166338.66 | 0.11582 | 0.00103 | 0.00000 | 0.00000E+00 | 0.00103 |
| 599749.31 | 4166342.79 | 0.19114 | 0.00169 | 0.00000 | 0.00000E+00 | 0.00169 |
| 599773.58 | 4166308.18 | 0.2664 | 0.00236 | 0.00000 | 0.00000E+00 | 0.00236 |
| 599787.53 | 4166296.81 | 0.3081 | 0.00273 | 0.00000 | 0.00000E+00 | 0.00273 |
| 599439.45 | 4166224.05 | 0.06672 | 0.00059 | 0.00000 | 0.00000E+00 | 0.00059 |
| 599416.62 | 4166137.54 | 0.09361 | 0.00083 | 0.00000 | 0.00000E+00 | 0.00083 |
| 599424.09 | 4166124.37 | 0.10724 | 0.00095 | 0.00000 | 0.00000E+00 | 0.00095 |
| 599429.36 | 4166143.69 | 0.09483 | 0.00084 | 0.00000 | 0.00000E+00 | 0.00084 |
| 599458.78 | 4166272.79 | 0.06086 | 0.00054 | 0.00000 | 0.00000E+00 | 0.00054 |
| 599538.7 | 4166310.99 | 0.07644 | 0.00068 | 0.00000 | 0.00000E+00 | 0.00068 |
| 599565.92 | 4166311.87 | 0.08541 | 0.00076 | 0.00000 | 0.00000E+00 | 0.00076 |
| 599348.53 | 4166130.26 | 0.08077 | 0.00072 | 0.00000 | 0.00000E+00 | 0.00072 |
| 599383.18 | 4166205.02 | 0.05851 | 0.00052 | 0.00000 | 0.00000E+00 | 0.00052 |
| 599364.34 | 4166167.94 | 0.06676 | 0.00059 | 0.00000 | 0.00000E+00 | 0.00059 |
| 599485.89 | 4166401.33 | 0.05212 | 0.00046 | 0.00000 | 0.00000E+00 | 0.00046 |
| 599574.63 | 4166367.9 | 0.07541 | 0.00067 | 0.00000 | 0.00000E+00 | 0.00067 |
| 599591.04 | 4166409.84 | 0.07271 | 0.00064 | 0.00000 | 0.00000E+00 | 0.00064 |
| 600138.3 | 4165809.31 | 2.45723 | 0.02178 | 0.00001 | 1.42936E-05 | 0.02179 |
| 600116.85 | 4165800.73 | 2.39714 | 0.02124 | 0.00002 | 2.85872E-05 | 0.02127 |
| 600084.67 | 4165785 | 2.09007 | 0.01852 | 0.00004 | 5.71743E-05 | 0.01858 |
| 600042.49 | 4165762.11 | 1.48036 | 0.01312 | 0.00007 | 1.00055E-04 | 0.01322 |
| 600006.02 | 4165743.52 | 0.91417 | 0.00810 | 0.00008 | 1.14349E-04 | 0.00822 |
| 599955.96 | 4165699.9 | 0.50206 | 0.00445 | 0.00005 | 7.14679E-05 | 0.00452 |
| 599899.58 | 4165667.19 | 0.37379 | 0.00331 | 0.00005 | 7.14679E-05 | 0.00338 |
| 599879.52 | 4165617.35 | 0.24539 | 0.00217 | 0.00003 | 4.28807E-05 | 0.00222 |
| 599739.82 | 4165597.07 | 0.23431 | 0.00208 | 0.00004 | 5.71743E-05 | 0.00213 |
| 599821.24 | 4165543.08 | 0.15195 | 0.00135 | 0.00001 | 1.42936E-05 | 0.00136 |
| 599661.78 | 4165616.02 | 0.2625 | 0.00233 | 0.00011 | 1.57229E-04 | 0.00248 |
| 599593.85 | 4165593.14 | 0.22901 | 0.00203 | 0.00004 | 5.71743E-05 | 0.00209 |
| 600423.04 | 4165950.07 | 0.99324 | 0.00880 | 0.00000 | 0.00000E+00 | 0.00880 |
| 600450.99 | 4165951.23 | 0.84523 | 0.00749 | 0.00000 | 0.00000E+00 | 0.00749 |
| 600482.43 | 4165952.4 | 0.71015 | 0.00629 | 0.00000 | 0.00000E+00 | 0.00629 |
| 600513.87 | 4165944.25 | 0.60232 | 0.00534 | 0.00000 | 0.00000E+00 | 0.00534 |
| 600538.32 | 4165900 | 0.54825 | 0.00486 | 0.00000 | 0.00000E+00 | 0.00486 |
| 600535.99 | 4165872.05 | 0.56223 | 0.00498 | 0.00000 | 0.00000E+00 | 0.00498 |
| 600477.77 | 4165819.66 | 0.65837 | 0.00583 | 0.00000 | 0.00000E+00 | 0.00583 |
| 600395.1 | 4165790.55 | 0.77024 | 0.00683 | 0.00000 | 0.00000E+00 | 0.00683 |
| 600400.92 | 4165624.03 | 0.28491 | 0.00252 | 0.00000 | 0.00000E+00 | 0.00252 |
| 600405.57 | 4165563.49 | 0.18879 | 0.00167 | 0.00000 | 0.00000E+00 | 0.00167 |
| 600431.19 | 4165518.07 | 0.14451 | 0.00128 | 0.00000 | 0.00000E+00 | 0.00128 |
| 599776.32 | 4165483.21 | 0.1078 | 0.00096 | 0.00001 | 1.42936E-05 | 0.00097 |
| 599825.22 | 4165468.07 | 0.09322 | 0.00083 | 0.00001 | 1.42936E-05 | 0.00084 |
| 599828.71 | 4165423.82 | 0.07439 | 0.00066 | 0.00000 | 0.00000E+00 | 0.00066 |
| 599818.23 | 4165383.07 | 0.06209 | 0.00055 | 0.00000 | 0.00000E+00 | 0.00055 |
| 599825.22 | 4165336.49 | 0.05064 | 0.00045 | 0.00000 | 0.00000E+00 | 0.00045 |
| 599480.55 | 4165898.91 | 0.61514 | 0.00545 | 0.00001 | 1.42936E-05 | 0.00547 |
| 599529.46 | 4165748.7 | 0.42305 | 0.00375 | 0.00005 | 7.14679E-05 | 0.00382 |
| 599489.86 | 4165591.5 | 0.1933 | 0.00171 | 0.00001 | 1.42936E-05 | 0.00173 |
| CONCUNIT ug/ | m^3 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0.00000 | 0.00000 | 0.00000E+00 | 0.00000 |

## Spotorno Ranch

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Infant**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | Unit DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 3rd Trimester | 1 | 10 | 361 | 0.85 | 0.25 | 11.6 |
| 1 | 1 | 10 | 1090 | 0.85 | 1 | 139.6 |
| 2 | 1 | 10 | 1090 | 0.85 | 1 | 139.6 |
| 3 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **Tier III Mitigation** **at Sensitive Recptors**

**Estimated Cancer Risks from Construction DPM - Infant Receptors**

| X (m) | Y (m) | InfantCancer Risk (3rd Trimester) 2018 (/million) | Infant Cancer Risk (year 1) 2018 (/million) | Infant Cancer Risk (year 2) 2019 (/million) | Child Cancer Risk (year 1) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.380 | 4.586 | 3.451 | 0.377 | 8.79410 |
| 599733.16 | 4165874.92 | 0.255 | 3.083 | 2.321 | 0.254 | 5.91210 |
| 599741.25 | 4165874.65 | 0.262 | 3.160 | 2.378 | 0.260 | 6.05967 |
| 599741.25 | 4165858.74 | 0.212 | 2.555 | 1.924 | 0.210 | 4.90018 |
| 599743.41 | 4165868.72 | 0.242 | 2.924 | 2.201 | 0.241 | 5.60720 |
| 599699.19 | 4165884.9 | 0.255 | 3.082 | 2.320 | 0.254 | 5.91151 |
| 599688.4 | 4165885.17 | 0.244 | 2.952 | 2.222 | 0.243 | 5.66138 |
| 599674.38 | 4165884.36 | 0.231 | 2.791 | 2.101 | 0.230 | 5.35270 |
| 599679.23 | 4165849.84 | 0.165 | 1.991 | 1.501 | 0.164 | 3.82086 |
| 599688.13 | 4165850.38 | 0.168 | 2.033 | 1.532 | 0.167 | 3.90052 |
| 599735.05 | 4165820.18 | 0.145 | 1.757 | 1.324 | 0.145 | 3.37178 |
| 599730.2 | 4165813.44 | 0.137 | 1.657 | 1.249 | 0.136 | 3.17942 |
| 599727.23 | 4165806.7 | 0.130 | 1.574 | 1.187 | 0.130 | 3.02151 |
| 599700.27 | 4165802.66 | 0.121 | 1.464 | 1.104 | 0.121 | 2.81024 |
| 599633.92 | 4165882.15 | 0.200 | 2.418 | 1.821 | 0.199 | 4.63765 |
| 599610.98 | 4165795.75 | 0.103 | 1.242 | 0.941 | 0.103 | 2.38820 |
| 599618.85 | 4165755 | 0.084 | 1.012 | 0.768 | 0.084 | 1.94785 |
| 599633.15 | 4165749.99 | 0.083 | 1.005 | 0.763 | 0.083 | 1.93401 |
| 599734.53 | 4165764.17 | 0.104 | 1.255 | 0.951 | 0.104 | 2.41433 |
| 599721.84 | 4165775.36 | 0.108 | 1.300 | 0.985 | 0.107 | 2.49934 |
| 599731.91 | 4165723.49 | 0.084 | 1.010 | 0.771 | 0.084 | 1.94825 |
| 599589.04 | 4166098.06 | 0.073 | 0.884 | 0.664 | 0.073 | 1.69439 |
| 599589.04 | 4166077.92 | 0.105 | 1.267 | 0.952 | 0.104 | 2.42793 |
| 599561.14 | 4166065 | 0.090 | 1.086 | 0.816 | 0.089 | 2.08176 |
| 599693.38 | 4166143.01 | 0.168 | 2.033 | 1.528 | 0.167 | 3.89563 |
| 599756.4 | 4166195.69 | 0.120 | 1.445 | 1.086 | 0.119 | 2.77020 |
| 599715.6 | 4166214.81 | 0.071 | 0.856 | 0.643 | 0.070 | 1.63989 |
| 599593.69 | 4166198.79 | 0.026 | 0.318 | 0.239 | 0.026 | 0.60992 |
| 599813.42 | 4166193.21 | 0.162 | 1.952 | 1.467 | 0.160 | 3.74053 |
| 599855.57 | 4166198.04 | 0.173 | 2.095 | 1.574 | 0.172 | 4.01485 |
| 599993.73 | 4166279.68 | 0.089 | 1.074 | 0.807 | 0.088 | 2.05745 |
| 599986.85 | 4166279.22 | 0.089 | 1.074 | 0.807 | 0.088 | 2.05816 |
| 599994.19 | 4166267.07 | 0.098 | 1.186 | 0.891 | 0.097 | 2.27283 |
| 599805.61 | 4166278.22 | 0.065 | 0.787 | 0.592 | 0.065 | 1.50905 |
| 599653.74 | 4166315.93 | 0.023 | 0.274 | 0.206 | 0.022 | 0.52453 |
| 599693 | 4166325.23 | 0.027 | 0.329 | 0.247 | 0.027 | 0.63048 |
| 599682.15 | 4166339.17 | 0.024 | 0.288 | 0.217 | 0.024 | 0.55257 |
| 599657.87 | 4166284.42 | 0.027 | 0.327 | 0.246 | 0.027 | 0.62646 |
| 599664.07 | 4166261.69 | 0.032 | 0.388 | 0.292 | 0.032 | 0.74415 |
| 599718.31 | 4166304.56 | 0.035 | 0.426 | 0.320 | 0.035 | 0.81624 |
| 599643.92 | 4166338.66 | 0.020 | 0.236 | 0.177 | 0.019 | 0.45181 |
| 599749.31 | 4166342.79 | 0.032 | 0.389 | 0.292 | 0.032 | 0.74563 |
| 599773.58 | 4166308.18 | 0.045 | 0.542 | 0.408 | 0.045 | 1.03922 |
| 599787.53 | 4166296.81 | 0.052 | 0.627 | 0.471 | 0.052 | 1.20189 |
| 599439.45 | 4166224.05 | 0.011 | 0.136 | 0.102 | 0.011 | 0.26027 |
| 599416.62 | 4166137.54 | 0.016 | 0.191 | 0.143 | 0.016 | 0.36517 |
| 599424.09 | 4166124.37 | 0.018 | 0.218 | 0.164 | 0.018 | 0.41834 |
| 599429.36 | 4166143.69 | 0.016 | 0.193 | 0.145 | 0.016 | 0.36993 |
| 599458.78 | 4166272.79 | 0.010 | 0.124 | 0.093 | 0.010 | 0.23741 |
| 599538.7 | 4166310.99 | 0.013 | 0.156 | 0.117 | 0.013 | 0.29819 |
| 599565.92 | 4166311.87 | 0.014 | 0.174 | 0.131 | 0.014 | 0.33318 |
| 599348.53 | 4166130.26 | 0.014 | 0.164 | 0.124 | 0.014 | 0.31508 |
| 599383.18 | 4166205.02 | 0.010 | 0.119 | 0.090 | 0.010 | 0.22825 |
| 599364.34 | 4166167.94 | 0.011 | 0.136 | 0.102 | 0.011 | 0.26043 |
| 599485.89 | 4166401.33 | 0.009 | 0.106 | 0.080 | 0.009 | 0.20332 |
| 599574.63 | 4166367.9 | 0.013 | 0.153 | 0.115 | 0.013 | 0.29417 |
| 599591.04 | 4166409.84 | 0.012 | 0.148 | 0.111 | 0.012 | 0.28364 |
| 600138.3 | 4165809.31 | 0.414 | 5.002 | 3.763 | 0.411 | 9.59002 |
| 600116.85 | 4165800.73 | 0.404 | 4.880 | 3.675 | 0.402 | 9.36003 |
| 600084.67 | 4165785 | 0.352 | 4.255 | 3.213 | 0.351 | 8.17099 |
| 600042.49 | 4165762.11 | 0.250 | 3.014 | 2.292 | 0.250 | 5.80577 |
| 600006.02 | 4165743.52 | 0.154 | 1.862 | 1.430 | 0.155 | 3.60150 |
| 599955.96 | 4165699.9 | 0.085 | 1.023 | 0.788 | 0.085 | 1.98061 |
| 599899.58 | 4165667.19 | 0.063 | 0.762 | 0.592 | 0.064 | 1.48023 |
| 599879.52 | 4165617.35 | 0.041 | 0.500 | 0.387 | 0.042 | 0.97051 |
| 599739.82 | 4165597.07 | 0.040 | 0.478 | 0.374 | 0.040 | 0.93171 |
| 599821.24 | 4165543.08 | 0.026 | 0.309 | 0.236 | 0.026 | 0.59717 |
| 599661.78 | 4165616.02 | 0.044 | 0.536 | 0.445 | 0.047 | 1.07260 |
| 599593.85 | 4165593.14 | 0.039 | 0.467 | 0.366 | 0.039 | 0.91103 |
| 600423.04 | 4165950.07 | 0.167 | 2.022 | 1.519 | 0.166 | 3.87461 |
| 600450.99 | 4165951.23 | 0.142 | 1.720 | 1.293 | 0.141 | 3.29722 |
| 600482.43 | 4165952.4 | 0.120 | 1.445 | 1.086 | 0.119 | 2.77028 |
| 600513.87 | 4165944.25 | 0.102 | 1.226 | 0.921 | 0.101 | 2.34964 |
| 600538.32 | 4165900 | 0.092 | 1.116 | 0.839 | 0.092 | 2.13871 |
| 600535.99 | 4165872.05 | 0.095 | 1.144 | 0.860 | 0.094 | 2.19325 |
| 600477.77 | 4165819.66 | 0.111 | 1.340 | 1.007 | 0.110 | 2.56829 |
| 600395.1 | 4165790.55 | 0.130 | 1.568 | 1.178 | 0.129 | 3.00469 |
| 600400.92 | 4165624.03 | 0.048 | 0.580 | 0.436 | 0.048 | 1.11143 |
| 600405.57 | 4165563.49 | 0.032 | 0.384 | 0.289 | 0.032 | 0.73647 |
| 600431.19 | 4165518.07 | 0.024 | 0.294 | 0.221 | 0.024 | 0.56373 |
| 599776.32 | 4165483.21 | 0.018 | 0.220 | 0.169 | 0.018 | 0.42494 |
| 599825.22 | 4165468.07 | 0.016 | 0.190 | 0.147 | 0.016 | 0.36807 |
| 599828.71 | 4165423.82 | 0.013 | 0.151 | 0.114 | 0.012 | 0.29019 |
| 599818.23 | 4165383.07 | 0.010 | 0.126 | 0.095 | 0.010 | 0.24221 |
| 599825.22 | 4165336.49 | 0.009 | 0.103 | 0.077 | 0.008 | 0.19755 |
| 599480.55 | 4165898.91 | 0.104 | 1.252 | 0.945 | 0.103 | 2.40407 |
| 599529.46 | 4165748.7 | 0.071 | 0.862 | 0.667 | 0.072 | 1.67239 |
| 599489.86 | 4165591.5 | 0.033 | 0.394 | 0.300 | 0.033 | 0.75848 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00000 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.000 | 0.00000 |

**Maximum Caner Risk**
9.6
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
No

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Child**
**UTM: (565046,4185977)**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |
| 2 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |
| 3 | 1 | 3 | 572 | 0.73 | 1 | 18.9 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **Tier III Mitigation** **at Sensitive Receptors**

**Estimated Cancer Risks from Construction DPM**

| X (m) | Y (m) | Child Cancer Risk (year 1) 2018 (/million) | Child Cancer Risk (year 2) 2019 (/million) | Child Cancer Risk (year 3) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.620 | 0.467 | 0.377 | 1.46 |
| 599733.16 | 4165874.92 | 0.417 | 0.314 | 0.254 | 0.98 |
| 599741.25 | 4165874.65 | 0.427 | 0.322 | 0.260 | 1.01 |
| 599741.25 | 4165858.74 | 0.345 | 0.260 | 0.210 | 0.82 |
| 599743.41 | 4165868.72 | 0.395 | 0.298 | 0.241 | 0.93 |
| 599699.19 | 4165884.9 | 0.417 | 0.314 | 0.254 | 0.98 |
| 599688.4 | 4165885.17 | 0.399 | 0.300 | 0.243 | 0.94 |
| 599674.38 | 4165884.36 | 0.377 | 0.284 | 0.230 | 0.89 |
| 599679.23 | 4165849.84 | 0.269 | 0.203 | 0.164 | 0.64 |
| 599688.13 | 4165850.38 | 0.275 | 0.207 | 0.167 | 0.65 |
| 599735.05 | 4165820.18 | 0.238 | 0.179 | 0.145 | 0.56 |
| 599730.2 | 4165813.44 | 0.224 | 0.169 | 0.136 | 0.53 |
| 599727.23 | 4165806.7 | 0.213 | 0.161 | 0.130 | 0.50 |
| 599700.27 | 4165802.66 | 0.198 | 0.149 | 0.121 | 0.47 |
| 599633.92 | 4165882.15 | 0.327 | 0.246 | 0.199 | 0.77 |
| 599610.98 | 4165795.75 | 0.168 | 0.127 | 0.103 | 0.40 |
| 599618.85 | 4165755 | 0.137 | 0.104 | 0.084 | 0.32 |
| 599633.15 | 4165749.99 | 0.136 | 0.103 | 0.083 | 0.32 |
| 599734.53 | 4165764.17 | 0.170 | 0.129 | 0.104 | 0.40 |
| 599721.84 | 4165775.36 | 0.176 | 0.133 | 0.107 | 0.42 |
| 599731.91 | 4165723.49 | 0.137 | 0.104 | 0.084 | 0.32 |
| 599589.04 | 4166098.06 | 0.120 | 0.090 | 0.073 | 0.28 |
| 599589.04 | 4166077.92 | 0.171 | 0.129 | 0.104 | 0.40 |
| 599561.14 | 4166065 | 0.147 | 0.110 | 0.089 | 0.35 |
| 599693.38 | 4166143.01 | 0.275 | 0.207 | 0.167 | 0.65 |
| 599756.4 | 4166195.69 | 0.195 | 0.147 | 0.119 | 0.46 |
| 599715.6 | 4166214.81 | 0.116 | 0.087 | 0.070 | 0.27 |
| 599593.69 | 4166198.79 | 0.043 | 0.032 | 0.026 | 0.10 |
| 599813.42 | 4166193.21 | 0.264 | 0.198 | 0.160 | 0.62 |
| 599855.57 | 4166198.04 | 0.283 | 0.213 | 0.172 | 0.67 |
| 599993.73 | 4166279.68 | 0.145 | 0.109 | 0.088 | 0.34 |
| 599986.85 | 4166279.22 | 0.145 | 0.109 | 0.088 | 0.34 |
| 599994.19 | 4166267.07 | 0.160 | 0.121 | 0.097 | 0.38 |
| 599805.61 | 4166278.22 | 0.106 | 0.080 | 0.065 | 0.25 |
| 599653.74 | 4166315.93 | 0.037 | 0.028 | 0.022 | 0.09 |
| 599693 | 4166325.23 | 0.044 | 0.033 | 0.027 | 0.10 |
| 599682.15 | 4166339.17 | 0.039 | 0.029 | 0.024 | 0.09 |
| 599657.87 | 4166284.42 | 0.044 | 0.033 | 0.027 | 0.10 |
| 599664.07 | 4166261.69 | 0.052 | 0.039 | 0.032 | 0.12 |
| 599718.31 | 4166304.56 | 0.058 | 0.043 | 0.035 | 0.14 |
| 599643.92 | 4166338.66 | 0.032 | 0.024 | 0.019 | 0.08 |
| 599749.31 | 4166342.79 | 0.053 | 0.040 | 0.032 | 0.12 |
| 599773.58 | 4166308.18 | 0.073 | 0.055 | 0.045 | 0.17 |
| 599787.53 | 4166296.81 | 0.085 | 0.064 | 0.052 | 0.20 |
| 599439.45 | 4166224.05 | 0.018 | 0.014 | 0.011 | 0.04 |
| 599416.62 | 4166137.54 | 0.026 | 0.019 | 0.016 | 0.06 |
| 599424.09 | 4166124.37 | 0.030 | 0.022 | 0.018 | 0.07 |
| 599429.36 | 4166143.69 | 0.026 | 0.020 | 0.016 | 0.06 |
| 599458.78 | 4166272.79 | 0.017 | 0.013 | 0.010 | 0.04 |
| 599538.7 | 4166310.99 | 0.021 | 0.016 | 0.013 | 0.05 |
| 599565.92 | 4166311.87 | 0.024 | 0.018 | 0.014 | 0.06 |
| 599348.53 | 4166130.26 | 0.022 | 0.017 | 0.014 | 0.05 |
| 599383.18 | 4166205.02 | 0.016 | 0.012 | 0.010 | 0.04 |
| 599364.34 | 4166167.94 | 0.018 | 0.014 | 0.011 | 0.04 |
| 599485.89 | 4166401.33 | 0.014 | 0.011 | 0.009 | 0.03 |
| 599574.63 | 4166367.9 | 0.021 | 0.016 | 0.013 | 0.05 |
| 599591.04 | 4166409.84 | 0.020 | 0.015 | 0.012 | 0.05 |
| 600138.3 | 4165809.31 | 0.676 | 0.509 | 0.411 | 1.60 |
| 600116.85 | 4165800.73 | 0.660 | 0.497 | 0.402 | 1.56 |
| 600084.67 | 4165785 | 0.575 | 0.434 | 0.351 | 1.36 |
| 600042.49 | 4165762.11 | 0.408 | 0.310 | 0.250 | 0.97 |
| 600006.02 | 4165743.52 | 0.252 | 0.193 | 0.155 | 0.60 |
| 599955.96 | 4165699.9 | 0.138 | 0.107 | 0.085 | 0.33 |
| 599899.58 | 4165667.19 | 0.103 | 0.080 | 0.064 | 0.25 |
| 599879.52 | 4165617.35 | 0.068 | 0.052 | 0.042 | 0.16 |
| 599739.82 | 4165597.07 | 0.065 | 0.051 | 0.040 | 0.16 |
| 599821.24 | 4165543.08 | 0.042 | 0.032 | 0.026 | 0.10 |
| 599661.78 | 4165616.02 | 0.072 | 0.060 | 0.047 | 0.18 |
| 599593.85 | 4165593.14 | 0.063 | 0.050 | 0.039 | 0.15 |
| 600423.04 | 4165950.07 | 0.273 | 0.205 | 0.166 | 0.64 |
| 600450.99 | 4165951.23 | 0.233 | 0.175 | 0.141 | 0.55 |
| 600482.43 | 4165952.4 | 0.195 | 0.147 | 0.119 | 0.46 |
| 600513.87 | 4165944.25 | 0.166 | 0.125 | 0.101 | 0.39 |
| 600538.32 | 4165900 | 0.151 | 0.113 | 0.092 | 0.36 |
| 600535.99 | 4165872.05 | 0.155 | 0.116 | 0.094 | 0.37 |
| 600477.77 | 4165819.66 | 0.181 | 0.136 | 0.110 | 0.43 |
| 600395.1 | 4165790.55 | 0.212 | 0.159 | 0.129 | 0.50 |
| 600400.92 | 4165624.03 | 0.078 | 0.059 | 0.048 | 0.18 |
| 600405.57 | 4165563.49 | 0.052 | 0.039 | 0.032 | 0.12 |
| 600431.19 | 4165518.07 | 0.040 | 0.030 | 0.024 | 0.09 |
| 599776.32 | 4165483.21 | 0.030 | 0.023 | 0.018 | 0.07 |
| 599825.22 | 4165468.07 | 0.026 | 0.020 | 0.016 | 0.06 |
| 599828.71 | 4165423.82 | 0.020 | 0.015 | 0.012 | 0.05 |
| 599818.23 | 4165383.07 | 0.017 | 0.013 | 0.010 | 0.04 |
| 599825.22 | 4165336.49 | 0.014 | 0.010 | 0.008 | 0.03 |
| 599480.55 | 4165898.91 | 0.169 | 0.128 | 0.103 | 0.40 |
| 599529.46 | 4165748.7 | 0.117 | 0.090 | 0.072 | 0.28 |
| 599489.86 | 4165591.5 | 0.053 | 0.041 | 0.033 | 0.13 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.00 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.00 |

**Maximum Caner Risk**
1.6
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
No

## Spotorno Ranch

**Tier III Mitigation**

**Cancer Risk Impacts from Construction at the Maximum Impacted Sensitive Receptor - Adult**

| | | |
|---|---|---|
| **Cancer Potency Factor:** | 1.1 | $(mg/kg\text{-}day)^{-1}$ |
| **Exposure Frequency** | 350 | days/year |
| **Averaging Period** | 25550 | days |

| Year | DPM Concentration (ug/m3) | Age Sensitivty Factor | Daily Breathing Rate (L/kg-day) | Time At Home Factor | Exposure Duration (years) | Unit Risk Factor $(ug/m3)^{-1}$ |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |
| 2 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |
| 3 | 1 | 1 | 261 | 0.72 | 1 | 2.8 |

BAAQMD 2016. Air Toxics NSR Program Health Risk Assessment (HRA) Guidelines

**Spotorno Ranch** **at Sensitive Receptors**

**Estimated Cancer Risks from Construction DPM**

| X (m) | Y (m) | Adult Cancer Risk (year 1) 2018 (/million) | Adult Cancer Risk (year 2) 2019 (/million) | Adult Cancer Risk (year 3) 2020 (/million) | Total Cancer Risk (/million) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.093 | 0.070 | 0.057 | 0.21960 |
| 599733.16 | 4165874.92 | 0.063 | 0.047 | 0.038 | 0.14764 |
| 599741.25 | 4165874.65 | 0.064 | 0.048 | 0.039 | 0.15132 |
| 599741.25 | 4165858.74 | 0.052 | 0.039 | 0.032 | 0.12237 |
| 599743.41 | 4165868.72 | 0.059 | 0.045 | 0.036 | 0.14002 |
| 599699.19 | 4165884.9 | 0.063 | 0.047 | 0.038 | 0.14762 |
| 599688.4 | 4165885.17 | 0.060 | 0.045 | 0.036 | 0.14138 |
| 599674.38 | 4165884.36 | 0.057 | 0.043 | 0.034 | 0.13367 |
| 599679.23 | 4165849.84 | 0.040 | 0.030 | 0.025 | 0.09542 |
| 599688.13 | 4165850.38 | 0.041 | 0.031 | 0.025 | 0.09741 |
| 599735.05 | 4165820.18 | 0.036 | 0.027 | 0.022 | 0.08421 |
| 599730.2 | 4165813.44 | 0.034 | 0.025 | 0.020 | 0.07940 |
| 599727.23 | 4165806.7 | 0.032 | 0.024 | 0.019 | 0.07546 |
| 599700.27 | 4165802.66 | 0.030 | 0.022 | 0.018 | 0.07019 |
| 599633.92 | 4165882.15 | 0.049 | 0.037 | 0.030 | 0.11582 |
| 599610.98 | 4165795.75 | 0.025 | 0.019 | 0.015 | 0.05966 |
| 599618.85 | 4165755 | 0.021 | 0.016 | 0.013 | 0.04867 |
| 599633.15 | 4165749.99 | 0.020 | 0.015 | 0.012 | 0.04832 |
| 599734.53 | 4165764.17 | 0.025 | 0.019 | 0.016 | 0.06031 |
| 599721.84 | 4165775.36 | 0.026 | 0.020 | 0.016 | 0.06244 |
| 599731.91 | 4165723.49 | 0.020 | 0.016 | 0.013 | 0.04869 |
| 599589.04 | 4166098.06 | 0.018 | 0.013 | 0.011 | 0.04231 |
| 599589.04 | 4166077.92 | 0.026 | 0.019 | 0.016 | 0.06063 |
| 599561.14 | 4166065 | 0.022 | 0.017 | 0.013 | 0.05198 |
| 599693.38 | 4166143.01 | 0.041 | 0.031 | 0.025 | 0.09727 |
| 599756.4 | 4166195.69 | 0.029 | 0.022 | 0.018 | 0.06917 |
| 599715.6 | 4166214.81 | 0.017 | 0.013 | 0.011 | 0.04095 |
| 599593.69 | 4166198.79 | 0.006 | 0.005 | 0.004 | 0.01523 |
| 599813.42 | 4166193.21 | 0.040 | 0.030 | 0.024 | 0.09340 |
| 599855.57 | 4166198.04 | 0.042 | 0.032 | 0.026 | 0.10025 |
| 599993.73 | 4166279.68 | 0.022 | 0.016 | 0.013 | 0.05137 |
| 599986.85 | 4166279.22 | 0.022 | 0.016 | 0.013 | 0.05139 |
| 599994.19 | 4166267.07 | 0.024 | 0.018 | 0.015 | 0.05675 |
| 599805.61 | 4166278.22 | 0.016 | 0.012 | 0.010 | 0.03768 |
| 599653.74 | 4166315.93 | 0.006 | 0.004 | 0.003 | 0.01310 |
| 599693 | 4166325.23 | 0.007 | 0.005 | 0.004 | 0.01574 |
| 599682.15 | 4166339.17 | 0.006 | 0.004 | 0.004 | 0.01380 |
| 599657.87 | 4166284.42 | 0.007 | 0.005 | 0.004 | 0.01564 |
| 599664.07 | 4166261.69 | 0.008 | 0.006 | 0.005 | 0.01858 |
| 599718.31 | 4166304.56 | 0.009 | 0.006 | 0.005 | 0.02038 |
| 599643.92 | 4166338.66 | 0.005 | 0.004 | 0.003 | 0.01128 |
| 599749.31 | 4166342.79 | 0.008 | 0.006 | 0.005 | 0.01862 |
| 599773.58 | 4166308.18 | 0.011 | 0.008 | 0.007 | 0.02595 |
| 599787.53 | 4166296.81 | 0.013 | 0.010 | 0.008 | 0.03001 |
| 599439.45 | 4166224.05 | 0.003 | 0.002 | 0.002 | 0.00650 |
| 599416.62 | 4166137.54 | 0.004 | 0.003 | 0.002 | 0.00912 |
| 599424.09 | 4166124.37 | 0.004 | 0.003 | 0.003 | 0.01045 |
| 599429.36 | 4166143.69 | 0.004 | 0.003 | 0.002 | 0.00924 |
| 599458.78 | 4166272.79 | 0.003 | 0.002 | 0.002 | 0.00593 |
| 599538.7 | 4166310.99 | 0.003 | 0.002 | 0.002 | 0.00745 |
| 599565.92 | 4166311.87 | 0.004 | 0.003 | 0.002 | 0.00832 |
| 599348.53 | 4166130.26 | 0.003 | 0.003 | 0.002 | 0.00787 |
| 599383.18 | 4166205.02 | 0.002 | 0.002 | 0.001 | 0.00570 |
| 599364.34 | 4166167.94 | 0.003 | 0.002 | 0.002 | 0.00650 |
| 599485.89 | 4166401.33 | 0.002 | 0.002 | 0.001 | 0.00508 |
| 599574.63 | 4166367.9 | 0.003 | 0.002 | 0.002 | 0.00735 |
| 599591.04 | 4166409.84 | 0.003 | 0.002 | 0.002 | 0.00708 |
| 600138.3 | 4165809.31 | 0.101 | 0.076 | 0.062 | 0.23948 |
| 600116.85 | 4165800.73 | 0.099 | 0.075 | 0.060 | 0.23375 |
| 600084.67 | 4165785 | 0.086 | 0.065 | 0.053 | 0.20408 |
| 600042.49 | 4165762.11 | 0.061 | 0.046 | 0.037 | 0.14507 |
| 600006.02 | 4165743.52 | 0.038 | 0.029 | 0.023 | 0.09004 |
| 599955.96 | 4165699.9 | 0.021 | 0.016 | 0.013 | 0.04953 |
| 599899.58 | 4165667.19 | 0.015 | 0.012 | 0.010 | 0.03703 |
| 599879.52 | 4165617.35 | 0.010 | 0.008 | 0.006 | 0.02428 |
| 599739.82 | 4165597.07 | 0.010 | 0.008 | 0.006 | 0.02332 |
| 599821.24 | 4165543.08 | 0.006 | 0.005 | 0.004 | 0.01493 |
| 599661.78 | 4165616.02 | 0.011 | 0.009 | 0.007 | 0.02694 |
| 599593.85 | 4165593.14 | 0.009 | 0.007 | 0.006 | 0.02280 |
| 600423.04 | 4165950.07 | 0.041 | 0.031 | 0.025 | 0.09675 |
| 600450.99 | 4165951.23 | 0.035 | 0.026 | 0.021 | 0.08233 |
| 600482.43 | 4165952.4 | 0.029 | 0.022 | 0.018 | 0.06917 |
| 600513.87 | 4165944.25 | 0.025 | 0.019 | 0.015 | 0.05867 |
| 600538.32 | 4165900 | 0.023 | 0.017 | 0.014 | 0.05340 |
| 600535.99 | 4165872.05 | 0.023 | 0.017 | 0.014 | 0.05477 |
| 600477.77 | 4165819.66 | 0.027 | 0.020 | 0.017 | 0.06413 |
| 600395.1 | 4165790.55 | 0.032 | 0.024 | 0.019 | 0.07503 |
| 600400.92 | 4165624.03 | 0.012 | 0.009 | 0.007 | 0.02775 |
| 600405.57 | 4165563.49 | 0.008 | 0.006 | 0.005 | 0.01839 |
| 600431.19 | 4165518.07 | 0.006 | 0.004 | 0.004 | 0.01408 |
| 599776.32 | 4165483.21 | 0.004 | 0.003 | 0.003 | 0.01062 |
| 599825.22 | 4165468.07 | 0.004 | 0.003 | 0.002 | 0.00920 |
| 599828.71 | 4165423.82 | 0.003 | 0.002 | 0.002 | 0.00725 |
| 599818.23 | 4165383.07 | 0.003 | 0.002 | 0.002 | 0.00605 |
| 599825.22 | 4165336.49 | 0.002 | 0.002 | 0.001 | 0.00493 |
| 599480.55 | 4165898.91 | 0.025 | 0.019 | 0.015 | 0.06004 |
| 599529.46 | 4165748.7 | 0.017 | 0.014 | 0.011 | 0.04183 |
| 599489.86 | 4165591.5 | 0.008 | 0.006 | 0.005 | 0.01895 |
| CONCUNIT ug | m^3 | 0.000 | 0.000 | 0.000 | 0.00000 |
| DEPUNIT g/m | 2 | 0.000 | 0.000 | 0.000 | 0.00000 |

**Maximum Caner Risk**
0.2
**BAAQMD threshold of significance**
10
**Exceed thresholds?**
No

**Spotorno Ranch**

**Tier III Mitigation**
**at Sensitive Receptors**

**Chronic Non-Cancer Hazard Index**

**Reference Exposure Level (REL) for DPM:** 5 ug/m3

**CNCHI = DPM/REL**

| X (m) | Y (m) | 2018 DPM (ug/m3) | 2019 DPM (ug/m3) | 2020 DPM (ug/m3) | Max DPM (ug/m3) | CNCHI |
|---|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.032852 | 0.024717 | 0.019983 | 0.033 | 0.00657 |
| 599733.16 | 4165874.92 | 0.022081 | 0.016622 | 0.013436 | 0.022 | 0.00442 |
| 599741.25 | 4165874.65 | 0.022632 | 0.017037 | 0.013771 | 0.023 | 0.00453 |
| 599741.25 | 4165858.74 | 0.018299 | 0.01378 | 0.011137 | 0.018 | 0.00366 |
| 599743.41 | 4165868.72 | 0.020941 | 0.015766 | 0.012743 | 0.021 | 0.00419 |
| 599699.19 | 4165884.9 | 0.022078 | 0.01662 | 0.013434 | 0.022 | 0.00442 |
| 599688.4 | 4165885.17 | 0.021144 | 0.015918 | 0.012866 | 0.021 | 0.00423 |
| 599674.38 | 4165884.36 | 0.01999 | 0.015051 | 0.012165 | 0.020 | 0.00400 |
| 599679.23 | 4165849.84 | 0.014265 | 0.010748 | 0.008685 | 0.014 | 0.00285 |
| 599688.13 | 4165850.38 | 0.014562 | 0.010972 | 0.008866 | 0.015 | 0.00291 |
| 599735.05 | 4165820.18 | 0.012586 | 0.009487 | 0.007664 | 0.013 | 0.00252 |
| 599730.2 | 4165813.44 | 0.011867 | 0.008946 | 0.007227 | 0.012 | 0.00237 |
| 599727.23 | 4165806.7 | 0.011277 | 0.008503 | 0.006869 | 0.011 | 0.00226 |
| 599700.27 | 4165802.66 | 0.010488 | 0.00791 | 0.006389 | 0.010 | 0.00210 |
| 599633.92 | 4165882.15 | 0.017317 | 0.013042 | 0.01054 | 0.017 | 0.00346 |
| 599610.98 | 4165795.75 | 0.008895 | 0.00674 | 0.005434 | 0.009 | 0.00178 |
| 599618.85 | 4165755 | 0.007249 | 0.005503 | 0.004434 | 0.007 | 0.00145 |
| 599633.15 | 4165749.99 | 0.007197 | 0.005464 | 0.004402 | 0.007 | 0.00144 |
| 599734.53 | 4165764.17 | 0.008993 | 0.006814 | 0.005493 | 0.009 | 0.00180 |
| 599721.84 | 4165775.36 | 0.00931 | 0.007052 | 0.005687 | 0.009 | 0.00186 |
| 599731.91 | 4165723.49 | 0.007235 | 0.005521 | 0.004439 | 0.007 | 0.00145 |
| 599589.04 | 4166098.06 | 0.006333 | 0.004759 | 0.003849 | 0.006 | 0.00127 |
| 599589.04 | 4166077.92 | 0.009074 | 0.00682 | 0.005516 | 0.009 | 0.00181 |
| 599561.14 | 4166065 | 0.00778 | 0.005847 | 0.004729 | 0.008 | 0.00156 |
| 599693.38 | 4166143.01 | 0.01456 | 0.010942 | 0.00885 | 0.015 | 0.00291 |
| 599756.4 | 4166195.69 | 0.010353 | 0.007781 | 0.006293 | 0.010 | 0.00207 |
| 599715.6 | 4166214.81 | 0.006129 | 0.004606 | 0.003726 | 0.006 | 0.00123 |
| 599593.69 | 4166198.79 | 0.00228 | 0.001713 | 0.001386 | 0.002 | 0.00046 |
| 599813.42 | 4166193.21 | 0.01398 | 0.010506 | 0.008498 | 0.014 | 0.00280 |
| 599855.57 | 4166198.04 | 0.015005 | 0.011277 | 0.009121 | 0.015 | 0.00300 |
| 599993.73 | 4166279.68 | 0.00769 | 0.005779 | 0.004674 | 0.008 | 0.00154 |
| 599986.85 | 4166279.22 | 0.007692 | 0.005781 | 0.004676 | 0.008 | 0.00154 |
| 599994.19 | 4166267.07 | 0.008495 | 0.006384 | 0.005163 | 0.008 | 0.00170 |
| 599805.61 | 4166278.22 | 0.00564 | 0.004239 | 0.003428 | 0.006 | 0.00113 |
| 599653.74 | 4166315.93 | 0.00196 | 0.001473 | 0.001192 | 0.002 | 0.00039 |
| 599693 | 4166325.23 | 0.002356 | 0.001771 | 0.001432 | 0.002 | 0.00047 |
| 599682.15 | 4166339.17 | 0.002065 | 0.001552 | 0.001255 | 0.002 | 0.00041 |
| 599657.87 | 4166284.42 | 0.002341 | 0.00176 | 0.001423 | 0.002 | 0.00047 |
| 599664.07 | 4166261.69 | 0.002781 | 0.00209 | 0.001691 | 0.003 | 0.00056 |
| 599718.31 | 4166304.56 | 0.003051 | 0.002293 | 0.001854 | 0.003 | 0.00061 |
| 599643.92 | 4166338.66 | 0.001689 | 0.001269 | 0.001026 | 0.002 | 0.00034 |
| 599749.31 | 4166342.79 | 0.002787 | 0.002094 | 0.001694 | 0.003 | 0.00056 |
| 599773.58 | 4166308.18 | 0.003884 | 0.002919 | 0.002361 | 0.004 | 0.00078 |
| 599787.53 | 4166296.81 | 0.004492 | 0.003376 | 0.002731 | 0.004 | 0.00090 |
| 599439.45 | 4166224.05 | 0.000973 | 0.000731 | 0.000591 | 0.001 | 0.00019 |
| 599416.62 | 4166137.54 | 0.001365 | 0.001026 | 0.00083 | 0.001 | 0.00027 |
| 599424.09 | 4166124.37 | 0.001564 | 0.001175 | 0.00095 | 0.002 | 0.00031 |
| 599429.36 | 4166143.69 | 0.001383 | 0.001039 | 0.00084 | 0.001 | 0.00028 |
| 599458.78 | 4166272.79 | 0.000887 | 0.000667 | 0.000539 | 0.001 | 0.00018 |
| 599538.7 | 4166310.99 | 0.001114 | 0.000838 | 0.000677 | 0.001 | 0.00022 |
| 599565.92 | 4166311.87 | 0.001245 | 0.000936 | 0.000757 | 0.001 | 0.00025 |
| 599348.53 | 4166130.26 | 0.001178 | 0.000885 | 0.000716 | 0.001 | 0.00024 |
| 599383.18 | 4166205.02 | 0.000853 | 0.000641 | 0.000519 | 0.001 | 0.00017 |
| 599364.34 | 4166167.94 | 0.000973 | 0.000731 | 0.000592 | 0.001 | 0.00019 |
| 599485.89 | 4166401.33 | 0.00076 | 0.000571 | 0.000462 | 0.001 | 0.00015 |
| 599574.63 | 4166367.9 | 0.001099 | 0.000826 | 0.000668 | 0.001 | 0.00022 |
| 599591.04 | 4166409.84 | 0.00106 | 0.000797 | 0.000644 | 0.001 | 0.00021 |
| 600138.3 | 4165809.31 | 0.035826 | 0.026953 | 0.021791 | 0.036 | 0.00717 |
| 600116.85 | 4165800.73 | 0.034951 | 0.026323 | 0.021273 | 0.035 | 0.00699 |
| 600084.67 | 4165785 | 0.030477 | 0.023015 | 0.01858 | 0.030 | 0.00610 |
| 600042.49 | 4165762.11 | 0.021591 | 0.01642 | 0.01322 | 0.022 | 0.00432 |
| 600006.02 | 4165743.52 | 0.013337 | 0.010245 | 0.008216 | 0.013 | 0.00267 |
| 599955.96 | 4165699.9 | 0.007325 | 0.005644 | 0.004521 | 0.007 | 0.00147 |
| 599899.58 | 4165667.19 | 0.005455 | 0.004238 | 0.003384 | 0.005 | 0.00109 |
| 599879.52 | 4165617.35 | 0.003581 | 0.002774 | 0.002218 | 0.004 | 0.00072 |
| 599739.82 | 4165597.07 | 0.00342 | 0.002682 | 0.002134 | 0.003 | 0.00068 |
| 599821.24 | 4165543.08 | 0.002216 | 0.001693 | 0.001361 | 0.002 | 0.00044 |
| 599661.78 | 4165616.02 | 0.003839 | 0.00319 | 0.002484 | 0.004 | 0.00077 |
| 599593.85 | 4165593.14 | 0.003343 | 0.002623 | 0.002087 | 0.003 | 0.00067 |
| 600423.04 | 4165950.07 | 0.014481 | 0.010883 | 0.008802 | 0.014 | 0.00290 |
| 600450.99 | 4165951.23 | 0.012323 | 0.009261 | 0.007491 | 0.012 | 0.00246 |
| 600482.43 | 4165952.4 | 0.010354 | 0.007781 | 0.006294 | 0.010 | 0.00207 |
| 600513.87 | 4165944.25 | 0.008782 | 0.0066 | 0.005338 | 0.009 | 0.00176 |
| 600538.32 | 4165900 | 0.007993 | 0.006007 | 0.004859 | 0.008 | 0.00160 |
| 600535.99 | 4165872.05 | 0.008197 | 0.00616 | 0.004983 | 0.008 | 0.00164 |
| 600477.77 | 4165819.66 | 0.009599 | 0.007214 | 0.005835 | 0.010 | 0.00192 |
| 600395.1 | 4165790.55 | 0.01123 | 0.00844 | 0.006826 | 0.011 | 0.00225 |
| 600400.92 | 4165624.03 | 0.004154 | 0.003122 | 0.002525 | 0.004 | 0.00083 |
| 600405.57 | 4165563.49 | 0.002752 | 0.002069 | 0.001673 | 0.003 | 0.00055 |
| 600431.19 | 4165518.07 | 0.002107 | 0.001583 | 0.001281 | 0.002 | 0.00042 |
| 599776.32 | 4165483.21 | 0.001573 | 0.00121 | 0.00097 | 0.002 | 0.00031 |
| 599825.22 | 4165468.07 | 0.00136 | 0.00105 | 0.00084 | 0.001 | 0.00027 |
| 599828.71 | 4165423.82 | 0.001085 | 0.000815 | 0.000659 | 0.001 | 0.00022 |
| 599818.23 | 4165383.07 | 0.000905 | 0.00068 | 0.00055 | 0.001 | 0.00018 |
| 599825.22 | 4165336.49 | 0.000738 | 0.000555 | 0.000449 | 0.001 | 0.00015 |
| 599480.55 | 4165898.91 | 0.00897 | 0.006769 | 0.005466 | 0.009 | 0.00179 |
| 599529.46 | 4165748.7 | 0.006173 | 0.004778 | 0.003821 | 0.006 | 0.00123 |
| 599489.86 | 4165591.5 | 0.002819 | 0.002147 | 0.001727 | 0.003 | 0.00056 |
| CONCUNIT ug/ m^3 | | 0 | 0 | 0 | 0.000 | 0.00000 |
| DEPUNIT g/m^ | 2 | 0 | 0 | 0 | 0.000 | 0.00000 |

**Maximum Caner Risk**
0.01
**BAAQMD threshold of significance**
1
**Exceed thresholds?**
No

**Spotorno Ranch**

**Tier III Mitigation**
**at Sensitive Receptors**

**Annual Average PM2.5 (Exhaust + Fugitive Dust)**

| X (m) | Y (m) | 2018 PM2.5 (ug/m3) | 2019 PM2.5 (ug/m3) | 2020 PM2.5 (ug/m3) | Max PM2.5 (ug/m3) |
|---|---|---|---|---|---|
| 599712.11 | 4165903.38 | 0.032852 | 0.024717 | 0.019983 | 0.03285 |
| 599733.16 | 4165874.92 | 0.022081 | 0.016622 | 0.013436 | 0.02208 |
| 599741.25 | 4165874.65 | 0.022632 | 0.017037 | 0.013771 | 0.02263 |
| 599741.25 | 4165858.74 | 0.018299 | 0.01378 | 0.011137 | 0.01830 |
| 599743.41 | 4165868.72 | 0.020941 | 0.015766 | 0.012743 | 0.02094 |
| 599699.19 | 4165884.9 | 0.022078 | 0.01662 | 0.013434 | 0.02208 |
| 599688.4 | 4165885.17 | 0.021144 | 0.015918 | 0.012866 | 0.02114 |
| 599674.38 | 4165884.36 | 0.01999 | 0.015051 | 0.012165 | 0.01999 |
| 599679.23 | 4165849.84 | 0.014265 | 0.010748 | 0.008685 | 0.01426 |
| 599688.13 | 4165850.38 | 0.014562 | 0.010972 | 0.008866 | 0.01456 |
| 599735.05 | 4165820.18 | 0.012586 | 0.009487 | 0.007664 | 0.01259 |
| 599730.2 | 4165813.44 | 0.011867 | 0.008946 | 0.007227 | 0.01187 |
| 599727.23 | 4165806.7 | 0.011277 | 0.008503 | 0.006869 | 0.01128 |
| 599700.27 | 4165802.66 | 0.010488 | 0.00791 | 0.006389 | 0.01049 |
| 599633.92 | 4165882.15 | 0.017317 | 0.013042 | 0.01054 | 0.01732 |
| 599610.98 | 4165795.75 | 0.008895 | 0.00674 | 0.005434 | 0.00889 |
| 599618.85 | 4165755 | 0.007249 | 0.005503 | 0.004434 | 0.00725 |
| 599633.15 | 4165749.99 | 0.007197 | 0.005464 | 0.004402 | 0.00720 |
| 599734.53 | 4165764.17 | 0.008993 | 0.006814 | 0.005493 | 0.00899 |
| 599721.84 | 4165775.36 | 0.00931 | 0.007052 | 0.005687 | 0.00931 |
| 599731.91 | 4165723.49 | 0.007235 | 0.005521 | 0.004439 | 0.00724 |
| 599589.04 | 4166098.06 | 0.006333 | 0.004759 | 0.003849 | 0.00633 |
| 599589.04 | 4166077.92 | 0.009074 | 0.00682 | 0.005516 | 0.00907 |
| 599561.14 | 4166065 | 0.00778 | 0.005847 | 0.004729 | 0.00778 |
| 599693.38 | 4166143.01 | 0.01456 | 0.010942 | 0.00885 | 0.01456 |
| 599756.4 | 4166195.69 | 0.010353 | 0.007781 | 0.006293 | 0.01035 |
| 599715.6 | 4166214.81 | 0.006129 | 0.004606 | 0.003726 | 0.00613 |
| 599593.69 | 4166198.79 | 0.00228 | 0.001713 | 0.001386 | 0.00228 |
| 599813.42 | 4166193.21 | 0.01398 | 0.010506 | 0.008498 | 0.01398 |
| 599855.57 | 4166198.04 | 0.015005 | 0.011277 | 0.009121 | 0.01501 |
| 599993.73 | 4166279.68 | 0.00769 | 0.005779 | 0.004674 | 0.00769 |
| 599986.85 | 4166279.22 | 0.007692 | 0.005781 | 0.004676 | 0.00769 |
| 599994.19 | 4166267.07 | 0.008495 | 0.006384 | 0.005163 | 0.00849 |
| 599805.61 | 4166278.22 | 0.00564 | 0.004239 | 0.003428 | 0.00564 |
| 599653.74 | 4166315.93 | 0.00196 | 0.001473 | 0.001192 | 0.00196 |
| 599693 | 4166325.23 | 0.002356 | 0.001771 | 0.001432 | 0.00236 |
| 599682.15 | 4166339.17 | 0.002065 | 0.001552 | 0.001255 | 0.00207 |
| 599657.87 | 4166284.42 | 0.002341 | 0.00176 | 0.001423 | 0.00234 |
| 599664.07 | 4166261.69 | 0.002781 | 0.00209 | 0.001691 | 0.00278 |
| 599718.31 | 4166304.56 | 0.003051 | 0.002293 | 0.001854 | 0.00305 |
| 599643.92 | 4166338.66 | 0.001689 | 0.001269 | 0.001026 | 0.00169 |
| 599749.31 | 4166342.79 | 0.002787 | 0.002094 | 0.001694 | 0.00279 |
| 599773.58 | 4166308.18 | 0.003884 | 0.002919 | 0.002361 | 0.00388 |
| 599787.53 | 4166296.81 | 0.004492 | 0.003376 | 0.002731 | 0.00449 |
| 599439.45 | 4166224.05 | 0.000973 | 0.000731 | 0.000591 | 0.00097 |
| 599416.62 | 4166137.54 | 0.001365 | 0.001026 | 0.00083 | 0.00136 |
| 599424.09 | 4166124.37 | 0.001564 | 0.001175 | 0.00095 | 0.00156 |
| 599429.36 | 4166143.69 | 0.001383 | 0.001039 | 0.00084 | 0.00138 |
| 599458.78 | 4166272.79 | 0.000887 | 0.000667 | 0.000539 | 0.00089 |
| 599538.7 | 4166310.99 | 0.001114 | 0.000838 | 0.000677 | 0.00111 |
| 599565.92 | 4166311.87 | 0.001245 | 0.000936 | 0.000757 | 0.00125 |
| 599348.53 | 4166130.26 | 0.001178 | 0.000885 | 0.000716 | 0.00118 |
| 599383.18 | 4166205.02 | 0.000853 | 0.000641 | 0.000519 | 0.00085 |
| 599364.34 | 4166167.94 | 0.000973 | 0.000731 | 0.000592 | 0.00097 |
| 599485.89 | 4166401.33 | 0.00076 | 0.000571 | 0.000462 | 0.00076 |
| 599574.63 | 4166367.9 | 0.001099 | 0.000826 | 0.000668 | 0.00110 |
| 599591.04 | 4166409.84 | 0.00106 | 0.000797 | 0.000644 | 0.00106 |
| 600138.3 | 4165809.31 | 0.035826 | 0.026953 | 0.021791 | 0.03583 |
| 600116.85 | 4165800.73 | 0.034951 | 0.026323 | 0.021273 | 0.03495 |
| 600084.67 | 4165785 | 0.030477 | 0.023015 | 0.01858 | 0.03048 |
| 600042.49 | 4165762.11 | 0.021591 | 0.01642 | 0.01322 | 0.02159 |
| 600006.02 | 4165743.52 | 0.013337 | 0.010245 | 0.008216 | 0.01334 |
| 599955.96 | 4165699.9 | 0.007325 | 0.005644 | 0.004521 | 0.00733 |
| 599899.58 | 4165667.19 | 0.005455 | 0.004238 | 0.003384 | 0.00546 |
| 599879.52 | 4165617.35 | 0.003581 | 0.002774 | 0.002218 | 0.00358 |
| 599739.82 | 4165597.07 | 0.00342 | 0.002682 | 0.002134 | 0.00342 |
| 599821.24 | 4165543.08 | 0.002216 | 0.001693 | 0.001361 | 0.00222 |
| 599661.78 | 4165616.02 | 0.003839 | 0.00319 | 0.002484 | 0.00384 |
| 599593.85 | 4165593.14 | 0.003343 | 0.002623 | 0.002087 | 0.00334 |
| 600423.04 | 4165950.07 | 0.014481 | 0.010883 | 0.008802 | 0.01448 |
| 600450.99 | 4165951.23 | 0.012323 | 0.009261 | 0.007491 | 0.01232 |
| 600482.43 | 4165952.4 | 0.010354 | 0.007781 | 0.006294 | 0.01035 |
| 600513.87 | 4165944.25 | 0.008782 | 0.0066 | 0.005338 | 0.00878 |
| 600538.32 | 4165900 | 0.007993 | 0.006007 | 0.004859 | 0.00799 |
| 600535.99 | 4165872.05 | 0.008197 | 0.00616 | 0.004983 | 0.00820 |
| 600477.77 | 4165819.66 | 0.009599 | 0.007214 | 0.005835 | 0.00960 |
| 600395.1 | 4165790.55 | 0.01123 | 0.00844 | 0.006826 | 0.01123 |
| 600400.92 | 4165624.03 | 0.004154 | 0.003122 | 0.002525 | 0.00415 |
| 600405.57 | 4165563.49 | 0.002752 | 0.002069 | 0.001673 | 0.00275 |
| 600431.19 | 4165518.07 | 0.002107 | 0.001583 | 0.001281 | 0.00211 |
| 599776.32 | 4165483.21 | 0.001573 | 0.00121 | 0.00097 | 0.00157 |
| 599825.22 | 4165468.07 | 0.00136 | 0.00105 | 0.00084 | 0.00136 |
| 599828.71 | 4165423.82 | 0.001085 | 0.000815 | 0.000659 | 0.00108 |
| 599818.23 | 4165383.07 | 0.000905 | 0.00068 | 0.00055 | 0.00091 |
| 599825.22 | 4165336.49 | 0.000738 | 0.000555 | 0.000449 | 0.00074 |
| 599480.55 | 4165898.91 | 0.00897 | 0.006769 | 0.005466 | 0.00897 |
| 599529.46 | 4165748.7 | 0.006173 | 0.004778 | 0.003821 | 0.00617 |
| 599489.86 | 4165591.5 | 0.002819 | 0.002147 | 0.001727 | 0.00282 |

**Maximum Caner Risk**
0.04
**BAAQMD threshold of significance**
0.3
**Exceed thresholds?**
No

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 9.5.0
** Lakes Environmental Software Inc.
** Date: 3/26/2018
** File: C:\Users\xli\Desktop\2148.0015 Sportono Ranch
EIR\construction HRA\construction HRA.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
**
CO STARTING
   TITLEONE C:\Users\xli\Desktop\2418.0015 Sportono Ranch
EIR\construction HRA\c
   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 60000
   POLLUTID DPM
   RUNORNOT RUN
   ERRORFIL "construction HRA.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
   LOCATION PAREA1       AREAPOLY   599649.882  4166107.043
118.870
** DESCRSRC On-site construction
** ---------------------------------------------------------------------
--
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC off-site construction truck
** PREFIX
** Length of Side = 9.00
** Configuration = Adjacent
** Emission Rate = 0.00001
** Elevated
** Vertical Dimension = 6.22
** SZINIT = 1.45
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** Nodes = 8
** 600055.230, 4165799.696, 123.12, 3.11, 4.19
** 599901.847, 4165722.497, 119.02, 3.11, 4.19
** 599789.095, 4165664.597, 116.01, 3.11, 4.19
** 599732.211, 4165644.281, 116.85, 3.11, 4.19
** 599574.765, 4165627.013, 115.18, 3.11, 4.19
** 599541.244, 4165655.455, 114.35, 3.11, 4.19
** 599442.713, 4165750.939, 109.55, 3.11, 4.19
** 599301.519, 4165835.249, 110.35, 3.11, 4.19
** ------------------------------------------------------------------
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   LOCATION L0000001     VOLUME   600051.211 4165797.673 122.92
   LOCATION L0000002     VOLUME   600043.172 4165793.627 122.66
   LOCATION L0000003     VOLUME   600035.132 4165789.581 122.39
   LOCATION L0000004     VOLUME   600027.093 4165785.535 122.12
   LOCATION L0000005     VOLUME   600019.054 4165781.488 121.85
   LOCATION L0000006     VOLUME   600011.015 4165777.442 121.58
   LOCATION L0000007     VOLUME   600002.976 4165773.396 121.32
   LOCATION L0000008     VOLUME   599994.937 4165769.350 121.05
   LOCATION L0000009     VOLUME   599986.897 4165765.304 121.00
   LOCATION L0000010     VOLUME   599978.858 4165761.257 121.00
   LOCATION L0000011     VOLUME   599970.819 4165757.211 121.00
   LOCATION L0000012     VOLUME   599962.780 4165753.165 120.98
   LOCATION L0000013     VOLUME   599954.741 4165749.119 120.71
   LOCATION L0000014     VOLUME   599946.702 4165745.072 120.44
   LOCATION L0000015     VOLUME   599938.662 4165741.026 120.17
   LOCATION L0000016     VOLUME   599930.623 4165736.980 119.94
   LOCATION L0000017     VOLUME   599922.584 4165732.934 119.72
   LOCATION L0000018     VOLUME   599914.545 4165728.888 119.43
   LOCATION L0000019     VOLUME   599906.506 4165724.841 119.10
   LOCATION L0000020     VOLUME   599898.481 4165720.768 119.00
   LOCATION L0000021     VOLUME   599890.474 4165716.657 119.00
   LOCATION L0000022     VOLUME   599882.468 4165712.545 119.00
   LOCATION L0000023     VOLUME   599874.462 4165708.434 119.00
   LOCATION L0000024     VOLUME   599866.456 4165704.323 118.77
   LOCATION L0000025     VOLUME   599858.450 4165700.212 118.50
   LOCATION L0000026     VOLUME   599850.444 4165696.100 118.23
   LOCATION L0000027     VOLUME   599842.438 4165691.989 117.97
   LOCATION L0000028     VOLUME   599834.432 4165687.878 117.70
   LOCATION L0000029     VOLUME   599826.426 4165683.767 117.43
   LOCATION L0000030     VOLUME   599818.419 4165679.655 117.16
   LOCATION L0000031     VOLUME   599810.413 4165675.544 116.93
   LOCATION L0000032     VOLUME   599802.407 4165671.433 116.70
   LOCATION L0000033     VOLUME   599794.401 4165667.322 116.39
   LOCATION L0000034     VOLUME   599786.237 4165663.576 116.09
   LOCATION L0000035     VOLUME   599777.761 4165660.549 116.00
   LOCATION L0000036     VOLUME   599769.285 4165657.522 116.00
   LOCATION L0000037     VOLUME   599760.810 4165654.495 116.00
   LOCATION L0000038     VOLUME   599752.334 4165651.468 116.02
   LOCATION L0000039     VOLUME   599743.858 4165648.441 116.19
   LOCATION L0000040     VOLUME   599735.383 4165645.414 116.41
   LOCATION L0000041     VOLUME   599726.612 4165643.667 116.66
```

| | | | | | |
|---|---|---|---|---|---|
| LOCATION | L0000042 | VOLUME | 599717.666 | 4165642.686 | 116.62 |
| LOCATION | L0000043 | VOLUME | 599708.720 | 4165641.705 | 116.41 |
| LOCATION | L0000044 | VOLUME | 599699.773 | 4165640.724 | 116.18 |
| LOCATION | L0000045 | VOLUME | 599690.827 | 4165639.743 | 115.91 |
| LOCATION | L0000046 | VOLUME | 599681.881 | 4165638.761 | 115.61 |
| LOCATION | L0000047 | VOLUME | 599672.934 | 4165637.780 | 115.32 |
| LOCATION | L0000048 | VOLUME | 599663.988 | 4165636.799 | 115.02 |
| LOCATION | L0000049 | VOLUME | 599655.042 | 4165635.818 | 115.00 |
| LOCATION | L0000050 | VOLUME | 599646.095 | 4165634.836 | 115.06 |
| LOCATION | L0000051 | VOLUME | 599637.149 | 4165633.855 | 115.13 |
| LOCATION | L0000052 | VOLUME | 599628.202 | 4165632.874 | 115.22 |
| LOCATION | L0000053 | VOLUME | 599619.256 | 4165631.893 | 115.33 |
| LOCATION | L0000054 | VOLUME | 599610.310 | 4165630.912 | 115.46 |
| LOCATION | L0000055 | VOLUME | 599601.363 | 4165629.930 | 115.59 |
| LOCATION | L0000056 | VOLUME | 599592.417 | 4165628.949 | 115.61 |
| LOCATION | L0000057 | VOLUME | 599583.471 | 4165627.968 | 115.62 |
| LOCATION | L0000058 | VOLUME | 599574.580 | 4165627.170 | 115.59 |
| LOCATION | L0000059 | VOLUME | 599567.718 | 4165632.993 | 115.44 |
| LOCATION | L0000060 | VOLUME | 599560.855 | 4165638.815 | 115.28 |
| LOCATION | L0000061 | VOLUME | 599553.993 | 4165644.638 | 115.17 |
| LOCATION | L0000062 | VOLUME | 599547.130 | 4165650.461 | 114.97 |
| LOCATION | L0000063 | VOLUME | 599540.324 | 4165656.346 | 114.88 |
| LOCATION | L0000064 | VOLUME | 599533.861 | 4165662.610 | 114.68 |
| LOCATION | L0000065 | VOLUME | 599527.398 | 4165668.873 | 114.23 |
| LOCATION | L0000066 | VOLUME | 599520.935 | 4165675.136 | 113.68 |
| LOCATION | L0000067 | VOLUME | 599514.472 | 4165681.399 | 112.94 |
| LOCATION | L0000068 | VOLUME | 599508.009 | 4165687.663 | 112.33 |
| LOCATION | L0000069 | VOLUME | 599501.546 | 4165693.926 | 111.69 |
| LOCATION | L0000070 | VOLUME | 599495.083 | 4165700.189 | 111.30 |
| LOCATION | L0000071 | VOLUME | 599488.619 | 4165706.452 | 110.90 |
| LOCATION | L0000072 | VOLUME | 599482.156 | 4165712.716 | 110.36 |
| LOCATION | L0000073 | VOLUME | 599475.693 | 4165718.979 | 109.81 |
| LOCATION | L0000074 | VOLUME | 599469.230 | 4165725.242 | 109.09 |
| LOCATION | L0000075 | VOLUME | 599462.767 | 4165731.505 | 109.19 |
| LOCATION | L0000076 | VOLUME | 599456.304 | 4165737.768 | 109.39 |
| LOCATION | L0000077 | VOLUME | 599449.841 | 4165744.032 | 109.53 |
| LOCATION | L0000078 | VOLUME | 599443.378 | 4165750.295 | 109.54 |
| LOCATION | L0000079 | VOLUME | 599435.780 | 4165755.079 | 109.40 |
| LOCATION | L0000080 | VOLUME | 599428.053 | 4165759.693 | 109.15 |
| LOCATION | L0000081 | VOLUME | 599420.326 | 4165764.307 | 108.90 |
| LOCATION | L0000082 | VOLUME | 599412.599 | 4165768.921 | 108.64 |
| LOCATION | L0000083 | VOLUME | 599404.871 | 4165773.535 | 108.38 |
| LOCATION | L0000084 | VOLUME | 599397.144 | 4165778.149 | 108.12 |
| LOCATION | L0000085 | VOLUME | 599389.417 | 4165782.763 | 108.06 |
| LOCATION | L0000086 | VOLUME | 599381.690 | 4165787.377 | 108.00 |
| LOCATION | L0000087 | VOLUME | 599373.962 | 4165791.991 | 108.00 |
| LOCATION | L0000088 | VOLUME | 599366.235 | 4165796.605 | 108.00 |
| LOCATION | L0000089 | VOLUME | 599358.508 | 4165801.220 | 108.33 |
| LOCATION | L0000090 | VOLUME | 599350.781 | 4165805.834 | 108.85 |
| LOCATION | L0000091 | VOLUME | 599343.054 | 4165810.448 | 109.36 |
| LOCATION | L0000092 | VOLUME | 599335.326 | 4165815.062 | 109.88 |
| LOCATION | L0000093 | VOLUME | 599327.599 | 4165819.676 | 110.14 |

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   LOCATION L0000094     VOLUME   599319.872 4165824.290 110.35
   LOCATION L0000095     VOLUME   599312.145 4165828.904 110.56
   LOCATION L0000096     VOLUME   599304.417 4165833.518 110.76
** End of LINE VOLUME Source ID = SLINE1
** Source Parameters **
   SRCPARAM PAREA1         0.00001     5.000         9
   AREAVERT PAREA1       599649.882 4166107.043 600029.231 4166116.629
   AREAVERT PAREA1       600055.251 4166149.497 600096.336 4166150.867
   AREAVERT PAREA1       600271.630 4165908.467 599977.190 4165766.040
   AREAVERT PAREA1       599974.451 4165924.901 599667.685 4165922.162
   AREAVERT PAREA1       599651.251 4165941.335
** LINE VOLUME Source ID = SLINE1
   SRCPARAM L0000001     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000002     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000003     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000004     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000005     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000006     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000007     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000008     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000009     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000010     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000011     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000012     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000013     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000014     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000015     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000016     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000017     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000018     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000019     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000020     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000021     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000022     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000023     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000024     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000025     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000026     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000027     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000028     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000029     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000030     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000031     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000032     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000033     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000034     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000035     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000036     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000037     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000038     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000039     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000040     0.0000001042      3.11      4.19      1.45
```

| | | | | |
|---|---|---|---|---|
| SRCPARAM | L0000041 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000042 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000043 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000044 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000045 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000046 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000047 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000048 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000049 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000050 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000051 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000052 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000053 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000054 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000055 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000056 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000057 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000058 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000059 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000060 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000061 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000062 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000063 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000064 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000065 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000066 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000067 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000068 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000069 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000070 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000071 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000072 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000073 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000074 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000075 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000076 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000077 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000078 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000079 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000080 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000081 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000082 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000083 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000084 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000085 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000086 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000087 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000088 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000089 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000090 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000091 | 0.0000001042 | 3.11 | 4.19 | 1.45 |
| SRCPARAM | L0000092 | 0.0000001042 | 3.11 | 4.19 | 1.45 |

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   SRCPARAM L0000093     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000094     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000095     0.0000001042      3.11      4.19      1.45
   SRCPARAM L0000096     0.0000001042      3.11      4.19      1.45
** ------------------------------------------------------------------
--
   URBANSRC PAREA1
   URBANSRC L0000001
   URBANSRC L0000002
   URBANSRC L0000003
   URBANSRC L0000004
   URBANSRC L0000005
   URBANSRC L0000006
   URBANSRC L0000007
   URBANSRC L0000008
   URBANSRC L0000009
   URBANSRC L0000010
   URBANSRC L0000011
   URBANSRC L0000012
   URBANSRC L0000013
   URBANSRC L0000014
   URBANSRC L0000015
   URBANSRC L0000016
   URBANSRC L0000017
   URBANSRC L0000018
   URBANSRC L0000019
   URBANSRC L0000020
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   URBANSRC L0000036
   URBANSRC L0000037
   URBANSRC L0000038
   URBANSRC L0000039
   URBANSRC L0000040
   URBANSRC L0000041
   URBANSRC L0000042
   URBANSRC L0000043
   URBANSRC L0000044
   URBANSRC L0000045
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URBANSRC L0000046
URBANSRC L0000047
URBANSRC L0000048
URBANSRC L0000049
URBANSRC L0000050
URBANSRC L0000051
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URBANSRC L0000053
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URBANSRC L0000086
URBANSRC L0000087
URBANSRC L0000088
URBANSRC L0000089
URBANSRC L0000090
URBANSRC L0000091
URBANSRC L0000092
URBANSRC L0000093
URBANSRC L0000094
URBANSRC L0000095
URBANSRC L0000096
```

```
** Variable Emissions Type: "By Hour / Day (HRDOW)"
** Variable Emission Scenario: "Scenario 2"
** WeekDays:
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT PAREA1       HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Saturday:
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** Sunday:
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT PAREA1       HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
** WeekDays:
   EMISFACT L0000001     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000001     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000001     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000001     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000002     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000002     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000002     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000002     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000003     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000003     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000003     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000003     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000004     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000004     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000004     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000004     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000005     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000005     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000005     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000005     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000006     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000006     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000006     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000006     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000007     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000007     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000007     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000007     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000008     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000008     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
   EMISFACT L0000008     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
   EMISFACT L0000008     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000009     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000009     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
```

```
EMISFACT L0000009     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000009     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000010     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000010     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000010     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000010     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000011     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000011     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000011     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000011     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000012     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000012     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000012     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000012     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000013     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000013     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000013     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000013     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000014     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000014     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000014     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000014     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000015     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000015     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000015     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000015     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000016     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000016     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000016     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000016     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000017     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000017     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000017     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000017     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000018     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000018     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000018     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000018     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000019     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000019     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000019     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000019     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000020     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000020     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000020     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000020     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000021     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000021     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000021     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000021     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000022     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000022     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
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EMISFACT L0000022     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000022     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000023     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000023     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000023     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000023     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000024     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000024     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000024     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000024     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000025     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000025     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000025     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000025     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000026     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000026     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000026     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000026     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000027     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000027     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000027     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
EMISFACT L0000027     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000028     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
EMISFACT L0000028     HRDOW 0.0 1.0 1.0 1.0 1.0 1.0
EMISFACT L0000028     HRDOW 1.0 1.0 1.0 0.0 0.0 0.0
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EMISFACT L0000029     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
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   EMISFACT L0000004     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
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   EMISFACT L0000096     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   EMISFACT L0000096     HRDOW 0.0 0.0 0.0 0.0 0.0 0.0
   SRCGROUP Area     PAREA1
   SRCGROUP Line     L0000001 L0000002 L0000003 L0000004 L0000005
L0000006
   SRCGROUP Line     L0000007 L0000008 L0000009 L0000010 L0000011
L0000012
   SRCGROUP Line     L0000013 L0000014 L0000015 L0000016 L0000017
L0000018
   SRCGROUP Line     L0000019 L0000020 L0000021 L0000022 L0000023
L0000024
   SRCGROUP Line     L0000025 L0000026 L0000027 L0000028 L0000029
L0000030
   SRCGROUP Line     L0000031 L0000032 L0000033 L0000034 L0000035
L0000036
   SRCGROUP Line     L0000037 L0000038 L0000039 L0000040 L0000041
L0000042
   SRCGROUP Line     L0000043 L0000044 L0000045 L0000046 L0000047
L0000048
   SRCGROUP Line     L0000049 L0000050 L0000051 L0000052 L0000053
L0000054
   SRCGROUP Line     L0000055 L0000056 L0000057 L0000058 L0000059
L0000060
   SRCGROUP Line     L0000061 L0000062 L0000063 L0000064 L0000065
L0000066
```

```
   SRCGROUP Line     L0000067 L0000068 L0000069 L0000070 L0000071
L0000072
   SRCGROUP Line     L0000073 L0000074 L0000075 L0000076 L0000077
L0000078
   SRCGROUP Line     L0000079 L0000080 L0000081 L0000082 L0000083
L0000084
   SRCGROUP Line     L0000085 L0000086 L0000087 L0000088 L0000089
L0000090
   SRCGROUP Line     L0000091 L0000092 L0000093 L0000094 L0000095
L0000096
   SRCGROUP ALL
SO FINISHED
**
****************************************
** AERMOD Receptor Pathway
****************************************
**
**
RE STARTING
   INCLUDED "construction HRA.rou"
RE FINISHED
**
****************************************
** AERMOD Meteorology Pathway
****************************************
**
**
ME STARTING
   SURFFILE ..\724927\724927.SFC
   PROFFILE ..\724927\724927.PFL
   SURFDATA 23285 2009
   UAIRDATA 23230 2009 OAKLAND/WSO_AP
   PROFBASE 119.8 METERS
ME FINISHED
**
****************************************
** AERMOD Output Pathway
****************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "construction HRA.AD\AN00GALL.PLT" 31
   PLOTFILE ANNUAL Area "construction HRA.AD\AN00G001.PLT" 32
   PLOTFILE ANNUAL Line "construction HRA.AD\AN00G002.PLT" 33
   SUMMFILE "construction HRA.sum"
OU FINISHED

 ***********************************
 *** SETUP Finishes Successfully ***
 ***********************************
```

```
 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                                ***     MODEL SETUP
OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for    97
Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =     60000.0 ;  Urban Roughness Length =  1.000 m

 **Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Urban Roughness Length of 1.0 Meter Assumed.

 **Other Options Specified:
        CCVR_Sub - Meteorological data includes CCVR substitutions
        TEMP_Sub - Meteorological data includes TEMP substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  DPM

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:     97 Source(s);       3 Source Group(s); and
88 Receptor(s)

                with:      0 POINT(s), including
                           0 POINTCAP(s) and      0 POINTHOR(s)
                 and:     96 VOLUME source(s)
                 and:      1 AREA type source(s)
```

```
                 and:      0 LINE source(s)
                 and:      0 OPENPIT source(s)
                 and:      0 BUOYANT LINE source(s) with      0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134

 **Output Options Selected:
          Model Outputs Tables of ANNUAL Averages by Receptor
          Model Outputs External File(s) of High Values for Plotting
(PLOTFILE Keyword)
          Model Outputs Separate Summary File of High Ranked Values
(SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:  c for
Calm Hours
                                                                  m for
Missing Hours
                                                                  b for
Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =
119.80 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units =
GRAMS/SEC                                ;  Emission Rate Unit Factor
=   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.6 MB of RAM.

 **Detailed Error/Message File:   construction HRA.err
 **File for Summary of Results:   construction HRA.sum

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                      *** VOLUME SOURCE
DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE
INIT.    INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT
SY       SZ     SOURCE  SCALAR VARY
```

```
     ID          CATS.                 (METERS) (METERS) (METERS) (METERS)
(METERS) (METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 L0000001         0   0.10420E-06  600051.2 4165797.7   122.9     3.11
4.19     1.45     YES   HRDOW
 L0000002         0   0.10420E-06  600043.2 4165793.6   122.7     3.11
4.19     1.45     YES   HRDOW
 L0000003         0   0.10420E-06  600035.1 4165789.6   122.4     3.11
4.19     1.45     YES   HRDOW
 L0000004         0   0.10420E-06  600027.1 4165785.5   122.1     3.11
4.19     1.45     YES   HRDOW
 L0000005         0   0.10420E-06  600019.1 4165781.5   121.8     3.11
4.19     1.45     YES   HRDOW
 L0000006         0   0.10420E-06  600011.0 4165777.4   121.6     3.11
4.19     1.45     YES   HRDOW
 L0000007         0   0.10420E-06  600003.0 4165773.4   121.3     3.11
4.19     1.45     YES   HRDOW
 L0000008         0   0.10420E-06  599994.9 4165769.3   121.0     3.11
4.19     1.45     YES   HRDOW
 L0000009         0   0.10420E-06  599986.9 4165765.3   121.0     3.11
4.19     1.45     YES   HRDOW
 L0000010         0   0.10420E-06  599978.9 4165761.3   121.0     3.11
4.19     1.45     YES   HRDOW
 L0000011         0   0.10420E-06  599970.8 4165757.2   121.0     3.11
4.19     1.45     YES   HRDOW
 L0000012         0   0.10420E-06  599962.8 4165753.2   121.0     3.11
4.19     1.45     YES   HRDOW
 L0000013         0   0.10420E-06  599954.7 4165749.1   120.7     3.11
4.19     1.45     YES   HRDOW
 L0000014         0   0.10420E-06  599946.7 4165745.1   120.4     3.11
4.19     1.45     YES   HRDOW
 L0000015         0   0.10420E-06  599938.7 4165741.0   120.2     3.11
4.19     1.45     YES   HRDOW
 L0000016         0   0.10420E-06  599930.6 4165737.0   119.9     3.11
4.19     1.45     YES   HRDOW
 L0000017         0   0.10420E-06  599922.6 4165732.9   119.7     3.11
4.19     1.45     YES   HRDOW
 L0000018         0   0.10420E-06  599914.5 4165728.9   119.4     3.11
4.19     1.45     YES   HRDOW
 L0000019         0   0.10420E-06  599906.5 4165724.8   119.1     3.11
4.19     1.45     YES   HRDOW
 L0000020         0   0.10420E-06  599898.5 4165720.8   119.0     3.11
4.19     1.45     YES   HRDOW
 L0000021         0   0.10420E-06  599890.5 4165716.7   119.0     3.11
4.19     1.45     YES   HRDOW
 L0000022         0   0.10420E-06  599882.5 4165712.5   119.0     3.11
4.19     1.45     YES   HRDOW
 L0000023         0   0.10420E-06  599874.5 4165708.4   119.0     3.11
4.19     1.45     YES   HRDOW
```

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 L0000024         0   0.10420E-06  599866.5 4165704.3   118.8     3.11
4.19     1.45     YES   HRDOW
 L0000025         0   0.10420E-06  599858.5 4165700.2   118.5     3.11
4.19     1.45     YES   HRDOW
 L0000026         0   0.10420E-06  599850.4 4165696.1   118.2     3.11
4.19     1.45     YES   HRDOW
 L0000027         0   0.10420E-06  599842.4 4165692.0   118.0     3.11
4.19     1.45     YES   HRDOW
 L0000028         0   0.10420E-06  599834.4 4165687.9   117.7     3.11
4.19     1.45     YES   HRDOW
 L0000029         0   0.10420E-06  599826.4 4165683.8   117.4     3.11
4.19     1.45     YES   HRDOW
 L0000030         0   0.10420E-06  599818.4 4165679.7   117.2     3.11
4.19     1.45     YES   HRDOW
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4.19     1.45     YES   HRDOW
 L0000032         0   0.10420E-06  599802.4 4165671.4   116.7     3.11
4.19     1.45     YES   HRDOW
 L0000033         0   0.10420E-06  599794.4 4165667.3   116.4     3.11
4.19     1.45     YES   HRDOW
 L0000034         0   0.10420E-06  599786.2 4165663.6   116.1     3.11
4.19     1.45     YES   HRDOW
 L0000035         0   0.10420E-06  599777.8 4165660.5   116.0     3.11
4.19     1.45     YES   HRDOW
 L0000036         0   0.10420E-06  599769.3 4165657.5   116.0     3.11
4.19     1.45     YES   HRDOW
 L0000037         0   0.10420E-06  599760.8 4165654.5   116.0     3.11
4.19     1.45     YES   HRDOW
 L0000038         0   0.10420E-06  599752.3 4165651.5   116.0     3.11
4.19     1.45     YES   HRDOW
 L0000039         0   0.10420E-06  599743.9 4165648.4   116.2     3.11
4.19     1.45     YES   HRDOW
 L0000040         0   0.10420E-06  599735.4 4165645.4   116.4     3.11
4.19     1.45     YES   HRDOW

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
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***        10:11:50

PAGE   3
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                      *** VOLUME SOURCE
DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE
INIT.    INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT
SY       SZ     SOURCE  SCALAR VARY
```

```
     ID          CATS.                 (METERS) (METERS) (METERS) (METERS)
(METERS) (METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 L0000041         0   0.10420E-06  599726.6 4165643.7   116.7     3.11
4.19     1.45     YES   HRDOW
 L0000042         0   0.10420E-06  599717.7 4165642.7   116.6     3.11
4.19     1.45     YES   HRDOW
 L0000043         0   0.10420E-06  599708.7 4165641.7   116.4     3.11
4.19     1.45     YES   HRDOW
 L0000044         0   0.10420E-06  599699.8 4165640.7   116.2     3.11
4.19     1.45     YES   HRDOW
 L0000045         0   0.10420E-06  599690.8 4165639.7   115.9     3.11
4.19     1.45     YES   HRDOW
 L0000046         0   0.10420E-06  599681.9 4165638.8   115.6     3.11
4.19     1.45     YES   HRDOW
 L0000047         0   0.10420E-06  599672.9 4165637.8   115.3     3.11
4.19     1.45     YES   HRDOW
 L0000048         0   0.10420E-06  599664.0 4165636.8   115.0     3.11
4.19     1.45     YES   HRDOW
 L0000049         0   0.10420E-06  599655.0 4165635.8   115.0     3.11
4.19     1.45     YES   HRDOW
 L0000050         0   0.10420E-06  599646.1 4165634.8   115.1     3.11
4.19     1.45     YES   HRDOW
 L0000051         0   0.10420E-06  599637.1 4165633.9   115.1     3.11
4.19     1.45     YES   HRDOW
 L0000052         0   0.10420E-06  599628.2 4165632.9   115.2     3.11
4.19     1.45     YES   HRDOW
 L0000053         0   0.10420E-06  599619.3 4165631.9   115.3     3.11
4.19     1.45     YES   HRDOW
 L0000054         0   0.10420E-06  599610.3 4165630.9   115.5     3.11
4.19     1.45     YES   HRDOW
 L0000055         0   0.10420E-06  599601.4 4165629.9   115.6     3.11
4.19     1.45     YES   HRDOW
 L0000056         0   0.10420E-06  599592.4 4165628.9   115.6     3.11
4.19     1.45     YES   HRDOW
 L0000057         0   0.10420E-06  599583.5 4165628.0   115.6     3.11
4.19     1.45     YES   HRDOW
 L0000058         0   0.10420E-06  599574.6 4165627.2   115.6     3.11
4.19     1.45     YES   HRDOW
 L0000059         0   0.10420E-06  599567.7 4165633.0   115.4     3.11
4.19     1.45     YES   HRDOW
 L0000060         0   0.10420E-06  599560.9 4165638.8   115.3     3.11
4.19     1.45     YES   HRDOW
 L0000061         0   0.10420E-06  599554.0 4165644.6   115.2     3.11
4.19     1.45     YES   HRDOW
 L0000062         0   0.10420E-06  599547.1 4165650.5   115.0     3.11
4.19     1.45     YES   HRDOW
 L0000063         0   0.10420E-06  599540.3 4165656.3   114.9     3.11
4.19     1.45     YES   HRDOW
```

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 L0000064         0   0.10420E-06  599533.9 4165662.6   114.7     3.11
4.19     1.45     YES   HRDOW
 L0000065         0   0.10420E-06  599527.4 4165668.9   114.2     3.11
4.19     1.45     YES   HRDOW
 L0000066         0   0.10420E-06  599520.9 4165675.1   113.7     3.11
4.19     1.45     YES   HRDOW
 L0000067         0   0.10420E-06  599514.5 4165681.4   112.9     3.11
4.19     1.45     YES   HRDOW
 L0000068         0   0.10420E-06  599508.0 4165687.7   112.3     3.11
4.19     1.45     YES   HRDOW
 L0000069         0   0.10420E-06  599501.5 4165693.9   111.7     3.11
4.19     1.45     YES   HRDOW
 L0000070         0   0.10420E-06  599495.1 4165700.2   111.3     3.11
4.19     1.45     YES   HRDOW
 L0000071         0   0.10420E-06  599488.6 4165706.5   110.9     3.11
4.19     1.45     YES   HRDOW
 L0000072         0   0.10420E-06  599482.2 4165712.7   110.4     3.11
4.19     1.45     YES   HRDOW
 L0000073         0   0.10420E-06  599475.7 4165719.0   109.8     3.11
4.19     1.45     YES   HRDOW
 L0000074         0   0.10420E-06  599469.2 4165725.2   109.1     3.11
4.19     1.45     YES   HRDOW
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4.19     1.45     YES   HRDOW
 L0000076         0   0.10420E-06  599456.3 4165737.8   109.4     3.11
4.19     1.45     YES   HRDOW
 L0000077         0   0.10420E-06  599449.8 4165744.0   109.5     3.11
4.19     1.45     YES   HRDOW
 L0000078         0   0.10420E-06  599443.4 4165750.3   109.5     3.11
4.19     1.45     YES   HRDOW
 L0000079         0   0.10420E-06  599435.8 4165755.1   109.4     3.11
4.19     1.45     YES   HRDOW
 L0000080         0   0.10420E-06  599428.1 4165759.7   109.1     3.11
4.19     1.45     YES   HRDOW

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
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 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE   4
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                      *** VOLUME SOURCE
DATA ***

               NUMBER EMISSION RATE                    BASE    RELEASE
INIT.    INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.   HEIGHT
SY       SZ     SOURCE  SCALAR VARY
```

```
     ID          CATS.                (METERS) (METERS) (METERS) (METERS)
(METERS) (METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 L0000081         0   0.10420E-06  599420.3 4165764.3   108.9     3.11
4.19     1.45     YES   HRDOW
 L0000082         0   0.10420E-06  599412.6 4165768.9   108.6     3.11
4.19     1.45     YES   HRDOW
 L0000083         0   0.10420E-06  599404.9 4165773.5   108.4     3.11
4.19     1.45     YES   HRDOW
 L0000084         0   0.10420E-06  599397.1 4165778.1   108.1     3.11
4.19     1.45     YES   HRDOW
 L0000085         0   0.10420E-06  599389.4 4165782.8   108.1     3.11
4.19     1.45     YES   HRDOW
 L0000086         0   0.10420E-06  599381.7 4165787.4   108.0     3.11
4.19     1.45     YES   HRDOW
 L0000087         0   0.10420E-06  599374.0 4165792.0   108.0     3.11
4.19     1.45     YES   HRDOW
 L0000088         0   0.10420E-06  599366.2 4165796.6   108.0     3.11
4.19     1.45     YES   HRDOW
 L0000089         0   0.10420E-06  599358.5 4165801.2   108.3     3.11
4.19     1.45     YES   HRDOW
 L0000090         0   0.10420E-06  599350.8 4165805.8   108.8     3.11
4.19     1.45     YES   HRDOW
 L0000091         0   0.10420E-06  599343.1 4165810.4   109.4     3.11
4.19     1.45     YES   HRDOW
 L0000092         0   0.10420E-06  599335.3 4165815.1   109.9     3.11
4.19     1.45     YES   HRDOW
 L0000093         0   0.10420E-06  599327.6 4165819.7   110.1     3.11
4.19     1.45     YES   HRDOW
 L0000094         0   0.10420E-06  599319.9 4165824.3   110.3     3.11
4.19     1.45     YES   HRDOW
 L0000095         0   0.10420E-06  599312.1 4165828.9   110.6     3.11
4.19     1.45     YES   HRDOW
 L0000096         0   0.10420E-06  599304.4 4165833.5   110.8     3.11
4.19     1.45     YES   HRDOW

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE   5
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                      *** AREAPOLY SOURCE
DATA ***

               NUMBER EMISSION RATE   LOCATION OF AREA  BASE
RELEASE  NUMBER      INIT.   URBAN  EMISSION RATE
```

```
   SOURCE       PART.  (GRAMS/SEC       X        Y      ELEV.
HEIGHT  OF VERTS.     SZ     SOURCE  SCALAR VARY
     ID         CATS.   /METER**2)   (METERS) (METERS) (METERS)
(METERS)            (METERS)              BY
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 PAREA1           0   0.10000E-04  599649.9 4166107.0   118.9     5.00
9         0.00     YES   HRDOW

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                            *** SOURCE IDs DEFINING
SOURCE GROUPS ***

 SRCGROUP ID                                                SOURCE IDs
 -----------                                                ----------


  AREA       PAREA1      ,

  LINE       L0000001    , L0000002    , L0000003    , L0000004    ,
L0000005    , L0000006    , L0000007    , L0000008    ,

             L0000009    , L0000010    , L0000011    , L0000012    ,
L0000013    , L0000014    , L0000015    , L0000016    ,

             L0000017    , L0000018    , L0000019    , L0000020    ,
L0000021    , L0000022    , L0000023    , L0000024    ,

             L0000025    , L0000026    , L0000027    , L0000028    ,
L0000029    , L0000030    , L0000031    , L0000032    ,

             L0000033    , L0000034    , L0000035    , L0000036    ,
L0000037    , L0000038    , L0000039    , L0000040    ,

             L0000041    , L0000042    , L0000043    , L0000044    ,
L0000045    , L0000046    , L0000047    , L0000048    ,

             L0000049    , L0000050    , L0000051    , L0000052    ,
L0000053    , L0000054    , L0000055    , L0000056    ,

             L0000057    , L0000058    , L0000059    , L0000060    ,
L0000061    , L0000062    , L0000063    , L0000064    ,
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             L0000065    , L0000066    , L0000067    , L0000068    ,
L0000069    , L0000070    , L0000071    , L0000072    ,

             L0000073    , L0000074    , L0000075    , L0000076    ,
L0000077    , L0000078    , L0000079    , L0000080    ,

             L0000081    , L0000082    , L0000083    , L0000084    ,
L0000085    , L0000086    , L0000087    , L0000088    ,

             L0000089    , L0000090    , L0000091    , L0000092    ,
L0000093    , L0000094    , L0000095    , L0000096    ,

  ALL        PAREA1      , L0000001    , L0000002    , L0000003    ,
L0000004    , L0000005    , L0000006    , L0000007    ,

             L0000008    , L0000009    , L0000010    , L0000011    ,
L0000012    , L0000013    , L0000014    , L0000015    ,

             L0000016    , L0000017    , L0000018    , L0000019    ,
L0000020    , L0000021    , L0000022    , L0000023    ,

             L0000024    , L0000025    , L0000026    , L0000027    ,
L0000028    , L0000029    , L0000030    , L0000031    ,

             L0000032    , L0000033    , L0000034    , L0000035    ,
L0000036    , L0000037    , L0000038    , L0000039    ,

             L0000040    , L0000041    , L0000042    , L0000043    ,
L0000044    , L0000045    , L0000046    , L0000047    ,

             L0000048    , L0000049    , L0000050    , L0000051    ,
L0000052    , L0000053    , L0000054    , L0000055    ,
```



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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                *** SOURCE IDs DEFINING
SOURCE GROUPS ***

 SRCGROUP ID                                                  SOURCE IDs
 -----------                                                  ----------


             L0000056    , L0000057    , L0000058    , L0000059    ,
L0000060    , L0000061    , L0000062    , L0000063    ,
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             L0000064    , L0000065    , L0000066    , L0000067    ,
L0000068    , L0000069    , L0000070    , L0000071    ,

             L0000072    , L0000073    , L0000074    , L0000075    ,
L0000076    , L0000077    , L0000078    , L0000079    ,

             L0000080    , L0000081    , L0000082    , L0000083    ,
L0000084    , L0000085    , L0000086    , L0000087    ,

             L0000088    , L0000089    , L0000090    , L0000091    ,
L0000092    , L0000093    , L0000094    , L0000095    ,

             L0000096    ,

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                          *** SOURCE IDs DEFINED AS
URBAN SOURCES ***

  URBAN ID   URBAN POP                                    SOURCE IDs
  --------   ---------                                    ----------


                60000.   PAREA1      , L0000001    , L0000002    ,
L0000003    , L0000004    , L0000005    , L0000006    ,
 L0000007    ,

             L0000008    , L0000009    , L0000010    , L0000011    ,
L0000012    , L0000013    , L0000014    , L0000015    ,

             L0000016    , L0000017    , L0000018    , L0000019    ,
L0000020    , L0000021    , L0000022    , L0000023    ,

             L0000024    , L0000025    , L0000026    , L0000027    ,
L0000028    , L0000029    , L0000030    , L0000031    ,

             L0000032    , L0000033    , L0000034    , L0000035    ,
L0000036    , L0000037    , L0000038    , L0000039    ,

             L0000040    , L0000041    , L0000042    , L0000043    ,
L0000044    , L0000045    , L0000046    , L0000047    ,

             L0000048    , L0000049    , L0000050    , L0000051    ,
L0000052    , L0000053    , L0000054    , L0000055    ,
```

```
             L0000056    , L0000057    , L0000058    , L0000059    ,
L0000060    , L0000061    , L0000062    , L0000063    ,

             L0000064    , L0000065    , L0000066    , L0000067    ,
L0000068    , L0000069    , L0000070    , L0000071    ,

             L0000072    , L0000073    , L0000074    , L0000075    ,
L0000076    , L0000077    , L0000078    , L0000079    ,

             L0000080    , L0000081    , L0000082    , L0000083    ,
L0000084    , L0000085    , L0000086    , L0000087    ,

             L0000088    , L0000089    , L0000090    , L0000091    ,
L0000092    , L0000093    , L0000094    , L0000095    ,

             L0000096    ,

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = PAREA1       ; SOURCE TYPE = AREAPOLY :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000001     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
```

```
 SOURCE ID = L0000002     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000003     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000004     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000005  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000006  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000007     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000008     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000009     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000010     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000011     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000012     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
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                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000013     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000014     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000015     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000016     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
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```
 SOURCE ID = L0000017     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000018     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000019     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000020  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000021  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000022     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000023     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

```
 SOURCE ID = L0000024     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

```
 SOURCE ID = L0000025     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000026     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000027     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
```

```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000028     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000029     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000030     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000031     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
```

```
 SOURCE ID = L0000032     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000033     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000034     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000035     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```



```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000036     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
```

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

DAY OF WEEK = WEEKDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01
13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SATURDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00
13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SUNDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00
13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000037 ; SOURCE TYPE = VOLUME :

HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

DAY OF WEEK = WEEKDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01
13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SATURDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00
13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000038     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000039     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000040     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000041     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000042     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
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```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000043     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000044     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000045     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
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   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000046     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
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```
 SOURCE ID = L0000047     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000048     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000049     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000050  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000051  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000052     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000053     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000054     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```



```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000055     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000056     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000057     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
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                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000058     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000059     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000060     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000061     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
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```
 SOURCE ID = L0000062     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000063     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000064     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000065  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000066  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000067     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000068     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000069 ; SOURCE TYPE = VOLUME :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

DAY OF WEEK = WEEKDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .1000E+01
9 .1000E+01 10 .1000E+01 11 .1000E+01 12 .1000E+01
13 .1000E+01 14 .1000E+01 15 .1000E+01 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SATURDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00
13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00

DAY OF WEEK = SUNDAY

1 .0000E+00 2 .0000E+00 3 .0000E+00 4 .0000E+00
5 .0000E+00 6 .0000E+00 7 .0000E+00 8 .0000E+00
9 .0000E+00 10 .0000E+00 11 .0000E+00 12 .0000E+00
13 .0000E+00 14 .0000E+00 15 .0000E+00 16 .0000E+00
17 .0000E+00 18 .0000E+00 19 .0000E+00 20 .0000E+00
21 .0000E+00 22 .0000E+00 23 .0000E+00 24 .0000E+00



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000070 ; SOURCE TYPE = VOLUME :
HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR HOUR SCALAR
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

DAY OF WEEK = WEEKDAY

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000071     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000072     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
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                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000073     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000074     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000075     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000076     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
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```
 SOURCE ID = L0000077     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000078     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000079     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000080  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000081  ; SOURCE TYPE = VOLUME  :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                              DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                              DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                              DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000082     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                              DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                              DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000083     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000084     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
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                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000085     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000086     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000087     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN
```

```
                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000088     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000089     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000090     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
```

```
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000091     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *
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```
 SOURCE ID = L0000092     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000093     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
```

```
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   * SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY
AND BY DAY OF WEEK (HRDOW) *

 SOURCE ID = L0000094     ; SOURCE TYPE = VOLUME   :
  HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR
SCALAR   HOUR   SCALAR   HOUR   SCALAR   HOUR   SCALAR
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
```

* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000095 ; SOURCE TYPE = VOLUME :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DAY OF WEEK = WEEKDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .1000E+01 | 9 | .1000E+01 | 10 | .1000E+01 | 11 | .1000E+01 | 12 | .1000E+01 | 13 | .1000E+01 | 14 | .1000E+01 |
| 15 | .1000E+01 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SATURDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |
| DAY OF WEEK = SUNDAY | | | | | | | | | | | | | |
| 1 | .0000E+00 | 2 | .0000E+00 | 3 | .0000E+00 | 4 | .0000E+00 | 5 | .0000E+00 | 6 | .0000E+00 | 7 | .0000E+00 |
| 8 | .0000E+00 | 9 | .0000E+00 | 10 | .0000E+00 | 11 | .0000E+00 | 12 | .0000E+00 | 13 | .0000E+00 | 14 | .0000E+00 |
| 15 | .0000E+00 | 16 | .0000E+00 | 17 | .0000E+00 | 18 | .0000E+00 | 19 | .0000E+00 | 20 | .0000E+00 | 21 | .0000E+00 |
| 22 | .0000E+00 | 23 | .0000E+00 | 24 | .0000E+00 | | | | | | | | |



* SOURCE EMISSION RATE SCALARS WHICH VARY DIURNALLY AND BY DAY OF WEEK (HRDOW) *

SOURCE ID = L0000096 ; SOURCE TYPE = VOLUME :

| HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR | HOUR | SCALAR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

```
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
                                                DAY OF WEEK = WEEKDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .1000E+01
    9  .1000E+01   10  .1000E+01   11  .1000E+01   12  .1000E+01
13  .1000E+01   14  .1000E+01   15  .1000E+01   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SATURDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00
                                                DAY OF WEEK = SUNDAY
    1  .0000E+00    2  .0000E+00    3  .0000E+00    4  .0000E+00
5  .0000E+00    6  .0000E+00    7  .0000E+00    8  .0000E+00
    9  .0000E+00   10  .0000E+00   11  .0000E+00   12  .0000E+00
13  .0000E+00   14  .0000E+00   15  .0000E+00   16  .0000E+00
   17  .0000E+00   18  .0000E+00   19  .0000E+00   20  .0000E+00
21  .0000E+00   22  .0000E+00   23  .0000E+00   24  .0000E+00

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 106
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                                *** DISCRETE CARTESIAN
RECEPTORS ***
                                              (X-COORD, Y-COORD, ZELEV,
ZHILL, ZFLAG)
                                                                  (METERS)

     ( 599712.1, 4165903.4,     116.6,     479.0,       0.0);
( 599733.2, 4165874.9,     117.0,     479.0,       0.0);
     ( 599741.2, 4165874.6,     117.0,     479.0,       0.0);
( 599741.2, 4165858.7,     116.8,     479.0,       0.0);
     ( 599743.4, 4165868.7,     116.9,     479.0,       0.0);
( 599699.2, 4165884.9,     116.2,     479.0,       0.0);
     ( 599688.4, 4165885.2,     116.0,     479.0,       0.0);
( 599674.4, 4165884.4,     116.0,     623.0,       0.0);
     ( 599679.2, 4165849.8,     116.0,     623.0,       0.0);
( 599688.1, 4165850.4,     116.0,     623.0,       0.0);
     ( 599735.1, 4165820.2,     116.4,     479.0,       0.0);
( 599730.2, 4165813.4,     116.2,     479.0,       0.0);
     ( 599727.2, 4165806.7,     116.1,     479.0,       0.0);
( 599700.3, 4165802.7,     116.0,     479.0,       0.0);
```

```
    ( 599633.9, 4165882.1,     115.0,     625.0,       0.0);
( 599611.0, 4165795.8,     116.0,     625.0,       0.0);
    ( 599618.9, 4165755.0,     116.0,     625.0,       0.0);
( 599633.2, 4165750.0,     116.0,     625.0,       0.0);
    ( 599734.5, 4165764.2,     116.8,     479.0,       0.0);
( 599721.8, 4165775.4,     116.3,     479.0,       0.0);
    ( 599731.9, 4165723.5,     116.9,     479.0,       0.0);
( 599589.0, 4166098.1,     120.1,     625.0,       0.0);
    ( 599589.0, 4166077.9,     119.2,     625.0,       0.0);
( 599561.1, 4166065.0,     119.7,     625.0,       0.0);
    ( 599693.4, 4166143.0,     119.9,     479.0,       0.0);
( 599756.4, 4166195.7,     121.1,     479.0,       0.0);
    ( 599715.6, 4166214.8,     121.2,     479.0,       0.0);
( 599593.7, 4166198.8,     121.8,     479.0,       0.0);
    ( 599813.4, 4166193.2,     121.6,     479.0,       0.0);
( 599855.6, 4166198.0,     122.1,     475.0,       0.0);
    ( 599993.7, 4166279.7,     138.0,     343.0,       0.0);
( 599986.9, 4166279.2,     137.2,     343.0,       0.0);
    ( 599994.2, 4166267.1,     137.2,     343.0,       0.0);
( 599805.6, 4166278.2,     124.4,     475.0,       0.0);
    ( 599653.7, 4166315.9,     122.7,     479.0,       0.0);
( 599693.0, 4166325.2,     123.0,     479.0,       0.0);
    ( 599682.2, 4166339.2,     123.7,     479.0,       0.0);
( 599657.9, 4166284.4,     121.7,     479.0,       0.0);
    ( 599664.1, 4166261.7,     121.0,     479.0,       0.0);
( 599718.3, 4166304.6,     123.1,     479.0,       0.0);
    ( 599643.9, 4166338.7,     123.4,     479.0,       0.0);
( 599749.3, 4166342.8,     125.4,     479.0,       0.0);
    ( 599773.6, 4166308.2,     125.1,     479.0,       0.0);
( 599787.5, 4166296.8,     125.0,     475.0,       0.0);
    ( 599439.5, 4166224.0,     123.0,     625.0,       0.0);
( 599416.6, 4166137.5,     126.4,     625.0,       0.0);
    ( 599424.1, 4166124.4,     125.9,     625.0,       0.0);
( 599429.4, 4166143.7,     125.4,     625.0,       0.0);
    ( 599458.8, 4166272.8,     122.8,     625.0,       0.0);
( 599538.7, 4166311.0,     123.0,     479.0,       0.0);
    ( 599565.9, 4166311.9,     123.8,     479.0,       0.0);
( 599348.5, 4166130.3,     126.0,     625.0,       0.0);
    ( 599383.2, 4166205.0,     124.3,     625.0,       0.0);
( 599364.3, 4166167.9,     125.6,     625.0,       0.0);
    ( 599485.9, 4166401.3,     123.0,     625.0,       0.0);
( 599574.6, 4166367.9,     124.0,     479.0,       0.0);
    ( 599591.0, 4166409.8,     124.5,     479.0,       0.0);
( 600138.3, 4165809.3,     127.0,     384.0,       0.0);
    ( 600116.9, 4165800.7,     126.2,     384.0,       0.0);
( 600084.7, 4165785.0,     125.0,     384.0,       0.0);
    ( 600042.5, 4165762.1,     122.6,     465.0,       0.0);
( 600006.0, 4165743.5,     121.4,     467.0,       0.0);
    ( 599956.0, 4165699.9,     120.8,     475.0,       0.0);
( 599899.6, 4165667.2,     119.8,     479.0,       0.0);
    ( 599879.5, 4165617.3,     119.2,     479.0,       0.0);
( 599739.8, 4165597.1,     121.5,     479.0,       0.0);
```

```
     ( 599821.2, 4165543.1,     123.4,     479.0,       0.0);
( 599661.8, 4165616.0,     115.7,     625.0,       0.0);
     ( 599593.9, 4165593.1,     120.6,     625.0,       0.0);
( 600423.0, 4165950.1,     146.6,     384.0,       0.0);
     ( 600451.0, 4165951.2,     148.9,     384.0,       0.0);
( 600482.4, 4165952.4,     152.5,     384.0,       0.0);
     ( 600513.9, 4165944.2,     158.1,     384.0,       0.0);
( 600538.3, 4165900.0,     161.0,     384.0,       0.0);
     ( 600536.0, 4165872.0,     157.3,     384.0,       0.0);
( 600477.8, 4165819.7,     153.0,     384.0,       0.0);
     ( 600395.1, 4165790.5,     148.6,     384.0,       0.0);
( 600400.9, 4165624.0,     139.2,     384.0,       0.0);
     ( 600405.6, 4165563.5,     139.2,     384.0,       0.0);
( 600431.2, 4165518.1,     139.7,     384.0,       0.0);
     ( 599776.3, 4165483.2,     127.9,     479.0,       0.0);
( 599825.2, 4165468.1,     128.9,     479.0,       0.0);
     ( 599828.7, 4165423.8,     131.1,     475.0,       0.0);
( 599818.2, 4165383.1,     133.7,     475.0,       0.0);
     ( 599825.2, 4165336.5,     137.0,     475.0,       0.0);
( 599480.6, 4165898.9,     115.7,     625.0,       0.0);
     ( 599529.5, 4165748.7,     112.2,     625.0,       0.0);
( 599489.9, 4165591.5,     134.4,     625.0,       0.0);

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 107
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                                *** METEOROLOGICAL DAYS
SELECTED FOR PROCESSING ***
                                                                    (1=YES;
0=NO)

            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1
1 1 1   1 1 1 1 1 1 1 1 1 1   1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1   1 1 1 1 1
```

NOTE: METEOROLOGICAL DATA ACTUALLY PROCESSED WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.

*** UPPER BOUND OF FIRST THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)

1.54, 3.09, 5.14, 8.23, 10.80,


*** MODELOPTs: RegDFAULT CONC ELEV URBAN

*** UP TO THE FIRST 24 HOURS OF METEOROLOGICAL DATA ***

Surface file: ..\724927\724927.SFC
Met Version: 14134
Profile file: ..\724927\724927.PFL
Surface format: FREE
Profile format: FREE
Surface station no.: 23285 Upper air station no.: 23230
Name: UNKNOWN
Name: OAKLAND/WSO_AP
Year: 2009
Year: 2009

First 24 hours of scalar data

| YR | MO | DY | JDY | HR | H0 | U* | W* | DT/DZ | ZICNV | ZIMCH | M-O LEN | Z0 | BOWEN | ALBEDO | REF WS | WD | HT | REF TA | HT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09 | 01 | 01 | 1 | 01 | -12.6 | 0.221 | -9.000 | -9.000 | -999. | 250. | 77.5 | 0.11 | 0.90 | 1.00 | 2.86 | 51. | 10.0 | 279.2 | 2.0 |
| 09 | 01 | 01 | 1 | 02 | -23.5 | 0.413 | -9.000 | -9.000 | -999. | 637. | 269.8 | 0.11 | 0.90 | 1.00 | 4.86 | 48. | 10.0 | 279.2 | 2.0 |
| 09 | 01 | 01 | 1 | 03 | -11.1 | 0.195 | -9.000 | -9.000 | -999. | 254. | 59.8 | 0.07 | 0.90 | 1.00 | 2.86 | 94. | 10.0 | 278.8 | 2.0 |
| 09 | 01 | 01 | 1 | 04 | -9.5 | 0.166 | -9.000 | -9.000 | -999. | 164. | 43.7 | 0.11 | 0.90 | 1.00 | 2.36 | 53. | 10.0 | 278.1 | 2.0 |
| 09 | 01 | 01 | 1 | 05 | -11.1 | 0.195 | -9.000 | -9.000 | -999. | 206. | 59.6 | 0.07 | 0.90 | 1.00 | 2.86 | 63. | 10.0 | 278.1 | 2.0 |

```
 09 01 01   1 06   -8.2  0.143 -9.000 -9.000 -999.  131.     32.3
0.07   0.90   1.00    2.36   72.   10.0  278.1    2.0
 09 01 01   1 07   -8.2  0.143 -9.000 -9.000 -999.  130.     32.3
0.07   0.90   1.00    2.36   75.   10.0  278.1    2.0
 09 01 01   1 08   -4.1  0.078 -9.000 -9.000 -999.   53.     10.3
0.11   0.90   0.75    1.76   13.   10.0  277.5    2.0
 09 01 01   1 09   -6.3  0.246 -9.000 -9.000 -999.  292.    211.6
0.12   0.90   0.40    2.86  347.   10.0  278.1    2.0
 09 01 01   1 10    6.6  0.303  0.261  0.016   96.  401.   -378.3
0.11   0.90   0.27    3.36   51.   10.0  278.8    2.0
 09 01 01   1 11   15.4  0.317  0.422  0.017  176.  429.   -186.8
0.07   0.90   0.23    3.86   94.   10.0  279.9    2.0
 09 01 01   1 12   47.5  0.448  0.742  0.017  309.  720.   -170.5
0.11   0.90   0.22    4.86   56.   10.0  280.9    2.0
 09 01 01   1 13   49.0  0.405  0.820  0.014  403.  621.   -122.0
0.07   0.90   0.21    4.86   63.   10.0  281.4    2.0
 09 01 01   1 14   42.7  0.405  0.809  0.014  444.  619.   -139.5
0.11   0.90   0.22    4.36   59.   10.0  282.0    2.0
 09 01 01   1 15   60.8  0.372  0.922  0.014  463.  545.    -75.6
0.07   0.90   0.25    4.36   72.   10.0  281.4    2.0
 09 01 01   1 16   14.1  0.309  0.569  0.016  467.  414.   -187.5
0.11   0.90   0.34    3.36   54.   10.0  282.0    2.0
 09 01 01   1 17  -30.4  0.311 -9.000 -9.000 -999.  417.     89.1
0.07   0.90   0.58    4.36   61.   10.0  280.4    2.0
 09 01 01   1 18  -27.0  0.239 -9.000 -9.000 -999.  282.     45.2
0.11   0.90   1.00    3.36   47.   10.0  279.9    2.0
 09 01 01   1 19  -14.9  0.131 -9.000 -9.000 -999.  120.     13.7
0.07   0.90   1.00    2.86   64.   10.0  279.2    2.0
 09 01 01   1 20   -5.8  0.078 -9.000 -9.000 -999.   53.      7.3
0.11   0.90   1.00    1.76   47.   10.0  278.8    2.0
 09 01 01   1 21 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.10   0.90   1.00    0.00    0.   10.0  277.5    2.0
 09 01 01   1 22   -4.9  0.070 -9.000 -9.000 -999.   44.      6.2
0.07   0.90   1.00    1.76   82.   10.0  276.4    2.0
 09 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.10   0.90   1.00    0.00    0.   10.0  277.0    2.0
 09 01 01   1 24 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.10   0.90   1.00    0.00    0.   10.0  277.0    2.0


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW  sigmaV
 09 01 01 01   10.0 1   51.    2.86   279.3   99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: AREA     ***
                                     INCLUDING SOURCE(S):
PAREA1      ,

                                                *** DISCRETE CARTESIAN
RECEPTOR POINTS ***

                                          ** CONC OF DPM      IN
MICROGRAMS/M**3                            **

       X-COORD (M)   Y-COORD (M)        CONC                       X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         599712.11    4165903.38        2.25320
599733.16    4165874.92        1.51441
         599741.25    4165874.65        1.55224
599741.25    4165858.74        1.25501
         599743.41    4165868.72        1.43625
599699.19    4165884.90        1.51426
         599688.40    4165885.17        1.45014
599674.38    4165884.36        1.37101
         599679.23    4165849.84        0.97833
599688.13    4165850.38        0.99875
         599735.05    4165820.18        0.86321
599730.20    4165813.44        0.81390
         599727.23    4165806.70        0.77342
599700.27    4165802.66        0.71926
         599633.92    4165882.15        1.18771
599610.98    4165795.75        0.60994
         599618.85    4165755.00        0.49706
599633.15    4165749.99        0.49351
         599734.53    4165764.17        0.61664
599721.84    4165775.36        0.63843
         599731.91    4165723.49        0.49603
599589.04    4166098.06        0.43435
         599589.04    4166077.92        0.62239
599561.14    4166065.00        0.53365
         599693.38    4166143.01        0.99863
599756.40    4166195.69        0.71013
         599715.60    4166214.81        0.42038
599593.69    4166198.79        0.15635
         599813.42    4166193.21        0.95887
599855.57    4166198.04        1.02919
         599993.73    4166279.68        0.52742
599986.85    4166279.22        0.52760
         599994.19    4166267.07        0.58263
599805.61    4166278.22        0.38684
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         599653.74    4166315.93        0.13446
599693.00    4166325.23        0.16162
         599682.15    4166339.17        0.14165
599657.87    4166284.42        0.16059
         599664.07    4166261.69        0.19076
599718.31    4166304.56        0.20924
         599643.92    4166338.66        0.11582
599749.31    4166342.79        0.19114
         599773.58    4166308.18        0.26640
599787.53    4166296.81        0.30810
         599439.45    4166224.05        0.06672
599416.62    4166137.54        0.09361
         599424.09    4166124.37        0.10724
599429.36    4166143.69        0.09483
         599458.78    4166272.79        0.06086
599538.70    4166310.99        0.07644
         599565.92    4166311.87        0.08541
599348.53    4166130.26        0.08077
         599383.18    4166205.02        0.05851
599364.34    4166167.94        0.06676
         599485.89    4166401.33        0.05212
599574.63    4166367.90        0.07541
         599591.04    4166409.84        0.07271
600138.30    4165809.31        2.45723
         600116.85    4165800.73        2.39714
600084.67    4165785.00        2.09007
         600042.49    4165762.11        1.48036
600006.02    4165743.52        0.91417
         599955.96    4165699.90        0.50206
599899.58    4165667.19        0.37379
         599879.52    4165617.35        0.24539
599739.82    4165597.07        0.23431
         599821.24    4165543.08        0.15195
599661.78    4165616.02        0.26250
         599593.85    4165593.14        0.22901
600423.04    4165950.07        0.99324
         600450.99    4165951.23        0.84523
600482.43    4165952.40        0.71015
         600513.87    4165944.25        0.60232
600538.32    4165900.00        0.54825
         600535.99    4165872.05        0.56223
600477.77    4165819.66        0.65837
         600395.10    4165790.55        0.77024
600400.92    4165624.03        0.28491
         600405.57    4165563.49        0.18879
600431.19    4165518.07        0.14451

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
```

```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: AREA     ***
                                  INCLUDING SOURCE(S):
PAREA1      ,

                                          *** DISCRETE CARTESIAN
RECEPTOR POINTS ***

                                       ** CONC OF DPM      IN
MICROGRAMS/M**3                         **

       X-COORD (M)   Y-COORD (M)        CONC                      X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         599776.32    4165483.21        0.10780
599825.22    4165468.07        0.09322
         599828.71    4165423.82        0.07439
599818.23    4165383.07        0.06209
         599825.22    4165336.49        0.05064
599480.55    4165898.91        0.61514
         599529.46    4165748.70        0.42305
599489.86    4165591.50        0.19330

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50
```


```
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: LINE     ***
                                  INCLUDING SOURCE(S):
L0000001    , L0000002    , L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    ,
L0000009    , L0000010    , L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    ,
L0000017    , L0000018    , L0000019    , L0000020    , L0000021    ,
                L0000022    , L0000023    , L0000024    ,
L0000025    , L0000026    , L0000027    , L0000028    ,  . . .      ,

                                          *** DISCRETE CARTESIAN
RECEPTOR POINTS ***

                                       ** CONC OF DPM      IN
MICROGRAMS/M**3                         **
```

```
       X-COORD (M)   Y-COORD (M)        CONC                        X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         599712.11    4165903.38        0.00001
599733.16    4165874.92        0.00001
         599741.25    4165874.65        0.00001
599741.25    4165858.74        0.00001
         599743.41    4165868.72        0.00001
599699.19    4165884.90        0.00001
         599688.40    4165885.17        0.00001
599674.38    4165884.36        0.00001
         599679.23    4165849.84        0.00001
599688.13    4165850.38        0.00001
         599735.05    4165820.18        0.00001
599730.20    4165813.44        0.00001
         599727.23    4165806.70        0.00001
599700.27    4165802.66        0.00001
         599633.92    4165882.15        0.00001
599610.98    4165795.75        0.00002
         599618.85    4165755.00        0.00002
599633.15    4165749.99        0.00002
         599734.53    4165764.17        0.00002
599721.84    4165775.36        0.00002
         599731.91    4165723.49        0.00003
599589.04    4166098.06        0.00000
         599589.04    4166077.92        0.00000
599561.14    4166065.00        0.00000
         599693.38    4166143.01        0.00000
599756.40    4166195.69        0.00000
         599715.60    4166214.81        0.00000
599593.69    4166198.79        0.00000
         599813.42    4166193.21        0.00000
599855.57    4166198.04        0.00000
         599993.73    4166279.68        0.00000
599986.85    4166279.22        0.00000
         599994.19    4166267.07        0.00000
599805.61    4166278.22        0.00000
         599653.74    4166315.93        0.00000
599693.00    4166325.23        0.00000
         599682.15    4166339.17        0.00000
599657.87    4166284.42        0.00000
         599664.07    4166261.69        0.00000
599718.31    4166304.56        0.00000
         599643.92    4166338.66        0.00000
599749.31    4166342.79        0.00000
         599773.58    4166308.18        0.00000
599787.53    4166296.81        0.00000
         599439.45    4166224.05        0.00000
599416.62    4166137.54        0.00000
```

```
         599424.09    4166124.37        0.00000
599429.36    4166143.69        0.00000
         599458.78    4166272.79        0.00000
599538.70    4166310.99        0.00000
         599565.92    4166311.87        0.00000
599348.53    4166130.26        0.00000
         599383.18    4166205.02        0.00000
599364.34    4166167.94        0.00000
         599485.89    4166401.33        0.00000
599574.63    4166367.90        0.00000
         599591.04    4166409.84        0.00000
600138.30    4165809.31        0.00001
         600116.85    4165800.73        0.00002
600084.67    4165785.00        0.00004
         600042.49    4165762.11        0.00007
600006.02    4165743.52        0.00008
         599955.96    4165699.90        0.00005
599899.58    4165667.19        0.00005
         599879.52    4165617.35        0.00003
599739.82    4165597.07        0.00004
         599821.24    4165543.08        0.00001
599661.78    4165616.02        0.00011
         599593.85    4165593.14        0.00004
600423.04    4165950.07        0.00000
         600450.99    4165951.23        0.00000
600482.43    4165952.40        0.00000
         600513.87    4165944.25        0.00000
600538.32    4165900.00        0.00000
         600535.99    4165872.05        0.00000
600477.77    4165819.66        0.00000
         600395.10    4165790.55        0.00000
600400.92    4165624.03        0.00000
         600405.57    4165563.49        0.00000
600431.19    4165518.07        0.00000

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 112
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                    *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: LINE     ***
                                   INCLUDING SOURCE(S):
L0000001    , L0000002    , L0000003    , L0000004    , L0000005    ,
                L0000006    , L0000007    , L0000008    ,
L0000009    , L0000010    , L0000011    , L0000012    , L0000013    ,
                L0000014    , L0000015    , L0000016    ,
L0000017    , L0000018    , L0000019    , L0000020    , L0000021    ,
```

```
                 L0000022    , L0000023    , L0000024    ,
L0000025    , L0000026    , L0000027    , L0000028    ,  . . .      ,

                                              *** DISCRETE CARTESIAN
RECEPTOR POINTS ***

                                         ** CONC OF DPM      IN
MICROGRAMS/M**3                           **

       X-COORD (M)   Y-COORD (M)        CONC                       X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         599776.32    4165483.21        0.00001
599825.22    4165468.07        0.00001
         599828.71    4165423.82        0.00000
599818.23    4165383.07        0.00000
         599825.22    4165336.49        0.00000
599480.55    4165898.91        0.00001
         599529.46    4165748.70        0.00005
599489.86    4165591.50        0.00001

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 113
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):
PAREA1      , L0000001    , L0000002    , L0000003    , L0000004    ,
                 L0000005    , L0000006    , L0000007    ,
L0000008    , L0000009    , L0000010    , L0000011    , L0000012    ,
                 L0000013    , L0000014    , L0000015    ,
L0000016    , L0000017    , L0000018    , L0000019    , L0000020    ,
                 L0000021    , L0000022    , L0000023    ,
L0000024    , L0000025    , L0000026    , L0000027    ,  . . .      ,

                                              *** DISCRETE CARTESIAN
RECEPTOR POINTS ***

                                         ** CONC OF DPM      IN
MICROGRAMS/M**3                           **

       X-COORD (M)   Y-COORD (M)        CONC                       X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
```

599712.11 4165903.38 2.25320
599733.16 4165874.92 1.51442
599741.25 4165874.65 1.55224
599741.25 4165858.74 1.25502
599743.41 4165868.72 1.43625
599699.19 4165884.90 1.51427
599688.40 4165885.17 1.45014
599674.38 4165884.36 1.37102
599679.23 4165849.84 0.97834
599688.13 4165850.38 0.99876
599735.05 4165820.18 0.86323
599730.20 4165813.44 0.81391
599727.23 4165806.70 0.77343
599700.27 4165802.66 0.71927
599633.92 4165882.15 1.18772
599610.98 4165795.75 0.60995
599618.85 4165755.00 0.49708
599633.15 4165749.99 0.49354
599734.53 4165764.17 0.61666
599721.84 4165775.36 0.63845
599731.91 4165723.49 0.49606
599589.04 4166098.06 0.43435
599589.04 4166077.92 0.62239
599561.14 4166065.00 0.53365
599693.38 4166143.01 0.99863
599756.40 4166195.69 0.71014
599715.60 4166214.81 0.42038
599593.69 4166198.79 0.15635
599813.42 4166193.21 0.95887
599855.57 4166198.04 1.02919
599993.73 4166279.68 0.52742
599986.85 4166279.22 0.52760
599994.19 4166267.07 0.58263
599805.61 4166278.22 0.38684
599653.74 4166315.93 0.13446
599693.00 4166325.23 0.16162
599682.15 4166339.17 0.14165
599657.87 4166284.42 0.16060
599664.07 4166261.69 0.19076
599718.31 4166304.56 0.20924
599643.92 4166338.66 0.11582
599749.31 4166342.79 0.19114
599773.58 4166308.18 0.26640
599787.53 4166296.81 0.30810
599439.45 4166224.05 0.06673
599416.62 4166137.54 0.09362
599424.09 4166124.37 0.10724
599429.36 4166143.69 0.09483
599458.78 4166272.79 0.06086
599538.70 4166310.99 0.07644
599565.92 4166311.87 0.08541
599348.53 4166130.26 0.08077

```
         599383.18    4166205.02        0.05851
599364.34    4166167.94        0.06676
         599485.89    4166401.33        0.05212
599574.63    4166367.90        0.07541
         599591.04    4166409.84        0.07271
600138.30    4165809.31        2.45724
         600116.85    4165800.73        2.39716
600084.67    4165785.00        2.09012
         600042.49    4165762.11        1.48043
600006.02    4165743.52        0.91425
         599955.96    4165699.90        0.50212
599899.58    4165667.19        0.37384
         599879.52    4165617.35        0.24542
599739.82    4165597.07        0.23435
         599821.24    4165543.08        0.15196
599661.78    4165616.02        0.26261
         599593.85    4165593.14        0.22905
600423.04    4165950.07        0.99324
         600450.99    4165951.23        0.84523
600482.43    4165952.40        0.71015
         600513.87    4165944.25        0.60232
600538.32    4165900.00        0.54826
         600535.99    4165872.05        0.56223
600477.77    4165819.66        0.65837
         600395.10    4165790.55        0.77024
600400.92    4165624.03        0.28491
         600405.57    4165563.49        0.18879
600431.19    4165518.07        0.14451

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 114
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                   *** THE ANNUAL AVERAGE CONCENTRATION    VALUES
AVERAGED OVER   5 YEARS FOR SOURCE GROUP: ALL      ***
                                  INCLUDING SOURCE(S):
PAREA1      , L0000001    , L0000002    , L0000003    , L0000004    ,
                L0000005    , L0000006    , L0000007    ,
L0000008    , L0000009    , L0000010    , L0000011    , L0000012    ,
                L0000013    , L0000014    , L0000015    ,
L0000016    , L0000017    , L0000018    , L0000019    , L0000020    ,
                L0000021    , L0000022    , L0000023    ,
L0000024    , L0000025    , L0000026    , L0000027    ,  . . .      ,

                                                *** DISCRETE CARTESIAN
RECEPTOR POINTS ***
```

```
                                        ** CONC OF DPM      IN
MICROGRAMS/M**3                          **

       X-COORD (M)   Y-COORD (M)        CONC                       X-
COORD (M)   Y-COORD (M)        CONC
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
         599776.32    4165483.21        0.10780
599825.22    4165468.07        0.09322
         599828.71    4165423.82        0.07439
599818.23    4165383.07        0.06209
         599825.22    4165336.49        0.05064
599480.55    4165898.91        0.61515
         599529.46    4165748.70        0.42310
599489.86    4165591.50        0.19331

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

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 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                       *** THE SUMMARY OF MAXIMUM ANNUAL
RESULTS AVERAGED OVER   5 YEARS ***


                                        ** CONC OF DPM      IN
MICROGRAMS/M**3                          **


NETWORK
GROUP ID                       AVERAGE CONC               RECEPTOR
(XR, YR, ZELEV, ZHILL, ZFLAG)  OF TYPE  GRID-ID
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - -

AREA      1ST HIGHEST VALUE IS       2.45723 AT (  600138.30,
4165809.31,   127.01,   384.00,    0.00)  DC
          2ND HIGHEST VALUE IS       2.39714 AT (  600116.85,
4165800.73,   126.17,   384.00,    0.00)  DC
          3RD HIGHEST VALUE IS       2.25320 AT (  599712.11,
4165903.38,   116.62,   479.00,    0.00)  DC
          4TH HIGHEST VALUE IS       2.09007 AT (  600084.67,
4165785.00,   125.04,   384.00,    0.00)  DC
          5TH HIGHEST VALUE IS       1.55224 AT (  599741.25,
4165874.65,   116.98,   479.00,    0.00)  DC
          6TH HIGHEST VALUE IS       1.51441 AT (  599733.16,
4165874.92,   116.98,   479.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.51426 AT (  599699.19,
4165884.90,   116.19,   479.00,    0.00)  DC
```

```
          8TH HIGHEST VALUE IS       1.48036 AT (  600042.49,
4165762.11,   122.63,   465.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.45014 AT (  599688.40,
4165885.17,   116.00,   479.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.43625 AT (  599743.41,
4165868.72,   116.92,   479.00,    0.00)  DC

LINE      1ST HIGHEST VALUE IS       0.00011 AT (  599661.78,
4165616.02,   115.70,   625.00,    0.00)  DC
          2ND HIGHEST VALUE IS       0.00008 AT (  600006.02,
4165743.52,   121.42,   467.00,    0.00)  DC
          3RD HIGHEST VALUE IS       0.00007 AT (  600042.49,
4165762.11,   122.63,   465.00,    0.00)  DC
          4TH HIGHEST VALUE IS       0.00005 AT (  599955.96,
4165699.90,   120.75,   475.00,    0.00)  DC
          5TH HIGHEST VALUE IS       0.00005 AT (  599899.58,
4165667.19,   119.83,   479.00,    0.00)  DC
          6TH HIGHEST VALUE IS       0.00005 AT (  599529.46,
4165748.70,   112.23,   625.00,    0.00)  DC
          7TH HIGHEST VALUE IS       0.00004 AT (  600084.67,
4165785.00,   125.04,   384.00,    0.00)  DC
          8TH HIGHEST VALUE IS       0.00004 AT (  599593.85,
4165593.14,   120.65,   625.00,    0.00)  DC
          9TH HIGHEST VALUE IS       0.00004 AT (  599739.82,
4165597.07,   121.51,   479.00,    0.00)  DC
         10TH HIGHEST VALUE IS       0.00003 AT (  599731.91,
4165723.49,   116.92,   479.00,    0.00)  DC

ALL       1ST HIGHEST VALUE IS       2.45724 AT (  600138.30,
4165809.31,   127.01,   384.00,    0.00)  DC
          2ND HIGHEST VALUE IS       2.39716 AT (  600116.85,
4165800.73,   126.17,   384.00,    0.00)  DC
          3RD HIGHEST VALUE IS       2.25320 AT (  599712.11,
4165903.38,   116.62,   479.00,    0.00)  DC
          4TH HIGHEST VALUE IS       2.09012 AT (  600084.67,
4165785.00,   125.04,   384.00,    0.00)  DC
          5TH HIGHEST VALUE IS       1.55224 AT (  599741.25,
4165874.65,   116.98,   479.00,    0.00)  DC
          6TH HIGHEST VALUE IS       1.51442 AT (  599733.16,
4165874.92,   116.98,   479.00,    0.00)  DC
          7TH HIGHEST VALUE IS       1.51427 AT (  599699.19,
4165884.90,   116.19,   479.00,    0.00)  DC
          8TH HIGHEST VALUE IS       1.48043 AT (  600042.49,
4165762.11,   122.63,   465.00,    0.00)  DC
          9TH HIGHEST VALUE IS       1.45014 AT (  599688.40,
4165885.17,   116.00,   479.00,    0.00)  DC
         10TH HIGHEST VALUE IS       1.43625 AT (  599743.41,
4165868.72,   116.92,   479.00,    0.00)  DC


 *** RECEPTOR TYPES:  GC = GRIDCART
                      GP = GRIDPOLR
```

```
                      DC = DISCCART
                      DP = DISCPOLR

 *** AERMOD - VERSION 16216r ***   *** C:\Users\xli\Desktop\2418.0015
Sportono Ranch EIR\construction HRA\c ***        03/26/18
 *** AERMET - VERSION  14134 ***   ***
***        10:11:50

PAGE 116
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

 *** Message Summary : AERMOD Model Execution ***

  --------- Summary of Total Messages --------

 A Total of            0 Fatal Error Message(s)
 A Total of            1 Warning Message(s)
 A Total of        15235 Informational Message(s)

 A Total of        43872 Hours Were Processed

 A Total of        13448 Calm Hours Identified

 A Total of         1787 Missing Hours Identified (  4.07 Percent)


    ******** FATAL ERROR MESSAGES ********
               ***  NONE  ***


    ********   WARNING MESSAGES   ********
 MX W481   43873         MAIN: Data Remaining After End of Year.
Number of Hours=           48

    ************************************
    *** AERMOD Finishes Successfully ***
    ************************************
```

# Appendix C:
# Biological Resources Supporting Information

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# C.1 - USFW Database Searches

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# Selected Elements by Scientific Name

## California Department of Fish and Wildlife

## California Natural Diversity Database

**Query Criteria:** Quad IS (Livermore (3712167))

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| ***Agelaius tricolor***<br>tricolored blackbird | ABPBXB0020 | None | Candidate Endangered | G2G3 | S1S2 | SSC |
| ***Ambystoma californiense***<br>California tiger salamander | AAAAA01180 | Threatened | Threatened | G2G3 | S2S3 | WL |
| ***Athene cunicularia***<br>burrowing owl | ABNSB10010 | None | None | G4 | S3 | SSC |
| ***Atriplex depressa***<br>brittlescale | PDCHE042L0 | None | None | G2 | S2 | 1B.2 |
| ***Atriplex minuscula***<br>lesser saltscale | PDCHE042M0 | None | None | G2 | S2 | 1B.1 |
| ***Bombus crotchii***<br>Crotch bumble bee | IIHYM24480 | None | None | G3G4 | S1S2 | |
| ***Bombus occidentalis***<br>western bumble bee | IIHYM24250 | None | None | G2G3 | S1 | |
| ***Branchinecta lynchi***<br>vernal pool fairy shrimp | ICBRA03030 | Threatened | None | G3 | S3 | |
| ***Buteo regalis***<br>ferruginous hawk | ABNKC19120 | None | None | G4 | S3S4 | WL |
| ***Centromadia parryi ssp. congdonii***<br>Congdon's tarplant | PDAST4R0P1 | None | None | G3T2 | S2 | 1B.1 |
| ***Chloropyron palmatum***<br>palmate-bracted salty bird's-beak | PDSCR0J0J0 | Endangered | Endangered | G1 | S1 | 1B.1 |
| ***Corynorhinus townsendii***<br>Townsend's big-eared bat | AMACC08010 | None | None | G3G4 | S2 | SSC |
| ***Elanus leucurus***<br>white-tailed kite | ABNKC06010 | None | None | G5 | S3S4 | FP |
| ***Emys marmorata***<br>western pond turtle | ARAAD02030 | None | None | G3G4 | S3 | SSC |
| ***Eremophila alpestris actia***<br>California horned lark | ABPAT02011 | None | None | G5T4Q | S4 | WL |
| ***Extriplex joaquinana***<br>San Joaquin spearscale | PDCHE041F3 | None | None | G2 | S2 | 1B.2 |
| ***Lasiurus cinereus***<br>hoary bat | AMACC05030 | None | None | G5 | S4 | |
| ***Linderiella occidentalis***<br>California linderiella | ICBRA06010 | None | None | G2G3 | S2S3 | |
| ***Navarretia prostrata***<br>prostrate vernal pool navarretia | PDPLM0C0Q0 | None | None | G2 | S2 | 1B.1 |
| ***Plagiobothrys glaber***<br>hairless popcornflower | PDBOR0V0B0 | None | None | GH | SH | 1A |

| Species | Element Code | Federal Status | State Status | Global Rank | State Rank | Rare Plant Rank/CDFW SSC or FP |
|---|---|---|---|---|---|---|
| ***Puccinellia simplex***<br>California alkali grass | PMPOA53110 | None | None | G3 | S2 | 1B.2 |
| ***Rana boylii***<br>foothill yellow-legged frog | AAABH01050 | None | Candidate Threatened | G3 | S3 | SSC |
| ***Rana draytonii***<br>California red-legged frog | AAABH01022 | Threatened | None | G2G3 | S2S3 | SSC |
| ***Spergularia macrotheca var. longistyla***<br>long-styled sand-spurrey | PDCAR0W062 | None | None | G5T2 | S2 | 1B.2 |
| ***Sycamore Alluvial Woodland***<br>Sycamore Alluvial Woodland | CTT62100CA | None | None | G1 | S1.1 | |
| ***Taxidea taxus***<br>American badger | AMAJF04010 | None | None | G5 | S3 | SSC |
| ***Trifolium hydrophilum***<br>saline clover | PDFAB400R5 | None | None | G2 | S2 | 1B.2 |
| ***Tropidocarpum capparideum***<br>caper-fruited tropidocarpum | PDBRA2R010 | None | None | G1 | S1 | 1B.1 |
| ***Valley Sink Scrub***<br>Valley Sink Scrub | CTT36210CA | None | None | G1 | S1.1 | |
| ***Vulpes macrotis mutica***<br>San Joaquin kit fox | AMAJA03041 | Endangered | Threatened | G4T2 | S2 | |

**Record Count: 30**

CNPS California Native Plant Society

# Plant List

## Inventory of Rare and Endangered Plants

**1** matches found. *Click on scientific name for details*

**Search Criteria**

California Rare Plant Rank is one of [1A, 1B, 2A, 2B, 3], FESA is one of [Endangered, Threatened], CESA is one of [Endangered, Threatened], Found in Alameda County, Found in Quad 3712167

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Remove Photos

| Scientific Name | Common Name | Family | Lifeform | Blooming Period | CA Rare Plant Rank | State Rank | Global Rank | Photo |
|---|---|---|---|---|---|---|---|---|
| Chloropyron palmatum | palmate-bracted bird's-beak | Orobanchaceae | annual herb (hemiparasitic) | May-Oct | 1B.1 | S1 | G1 | 2007 John Game |

**Suggested Citation**

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 20 February 2018].

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The Consortium of California Herbaria
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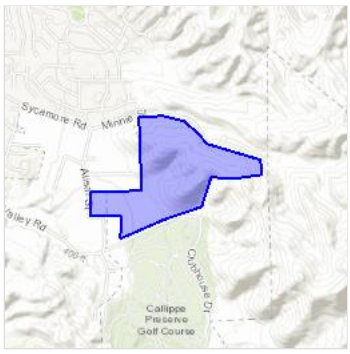
# IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

## Location

Alameda County, California




## Local office

Sacramento Fish And Wildlife Office

(916) 414-6600
(916) 414-6713

Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846

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# Endangered species

**This resource list is for informational purposes only and does not constitute an analysis of project level impacts.**

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.

The following species are potentially affected by activities in this location:

## Mammals

| NAME | STATUS |
|---|---|
| San Joaquin Kit Fox *Vulpes macrotis mutica*<br>No critical habitat has been designated for this species.<br>https://ecos.fws.gov/ecp/species/2873 | Endangered |

## Birds

| NAME | STATUS |
|---|---|
| California Least Tern *Sterna antillarum browni*<br>No critical habitat has been designated for this species.<br>https://ecos.fws.gov/ecp/species/8104 | Endangered |

## Reptiles

| NAME | STATUS |
|---|---|
| Alameda Whipsnake (=striped Racer) *Masticophis lateralis euryxanthus*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/5524 | Threatened |

## Amphibians

| NAME | STATUS |
|---|---|
| California Red-legged Frog *Rana draytonii*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/2891 | Threatened |
| California Tiger Salamander *Ambystoma californiense*<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/2076 | Threatened |

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## Fishes

| NAME | STATUS |
|---|---|
| Delta Smelt Hypomesus transpacificus<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/321 | Threatened |

## Insects

| NAME | STATUS |
|---|---|
| San Bruno Elfin Butterfly Callophrys mossii bayensis<br>There is **proposed** critical habitat for this species. The location of the critical habitat is not available.<br>https://ecos.fws.gov/ecp/species/3394 | Endangered |
| Valley Elderberry Longhorn Beetle Desmocerus californicus dimorphus<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/7850 | Threatened |

## Crustaceans

| NAME | STATUS |
|---|---|
| Conservancy Fairy Shrimp Branchinecta conservatio<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/8246 | Endangered |
| Vernal Pool Fairy Shrimp Branchinecta lynchi<br>There is **final** critical habitat for this species. Your location is outside the critical habitat.<br>https://ecos.fws.gov/ecp/species/498 | Threatened |

## Flowering Plants

| NAME | STATUS |
|---|---|
| Palmate-bracted Bird's Beak Cordylanthus palmatus<br>No critical habitat has been designated for this species.<br>https://ecos.fws.gov/ecp/species/1616 | Endangered |

## Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

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# Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain timeframe) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain timeframe). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

| NAME | BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.) |
|---|---|
| Allen's Hummingbird Selasphorus sasin<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9637 | Breeds Feb 1 to Jul 15 |
| Ashy Storm-petrel Oceanodroma homochroa<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/7237 | Breeds May 1 to Jan 15 |
| Bald Eagle Haliaeetus leucocephalus<br>This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.<br>https://ecos.fws.gov/ecp/species/1626 | Breeds Jan 1 to Aug 31 |
| Black Oystercatcher Haematopus bachmani<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/9591 | Breeds Apr 15 to Oct 31 |
| Black Rail Laterallus jamaicensis<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/7717 | Breeds Mar 1 to Sep 15 |
| Black Skimmer Rynchops niger<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/5234 | Breeds May 20 to Sep 15 |
| Black Swift Cypseloides niger<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.<br>https://ecos.fws.gov/ecp/species/8878 | Breeds Jun 15 to Sep 10 |
| Black Turnstone Arenaria melanocephala<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds elsewhere |
| Burrowing Owl Athene cunicularia<br>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA<br>https://ecos.fws.gov/ecp/species/9737 | Breeds Mar 15 to Aug 31 |
| California Thrasher Toxostoma redivivum<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Jan 1 to Jul 31 |
| Clark's Grebe Aechmophorus clarkii<br>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. | Breeds Jan 1 to Dec 31 |

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Costa's Hummingbird Calypte costae — Breeds Jan 15 to Jun 10
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9470

Golden Eagle Aquila chrysaetos — Breeds Jan 1 to Aug 31
This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.
https://ecos.fws.gov/ecp/species/1680

Lawrence's Goldfinch Carduelis lawrencei — Breeds Mar 20 to Sep 20
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9464

Lewis's Woodpecker Melanerpes lewis — Breeds Apr 20 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9408

Long-billed Curlew Numenius americanus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/5511

Marbled Godwit Limosa fedoa — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9481

Nuttall's Woodpecker Picoides nuttallii — Breeds Apr 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA
https://ecos.fws.gov/ecp/species/9410

Oak Titmouse Baeolophus inornatus — Breeds Mar 15 to Jul 15
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9656

Rufous Hummingbird selasphorus rufus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/8002

Short-billed Dowitcher Limnodromus griseus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9480

Tricolored Blackbird Agelaius tricolor — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/3910

Whimbrel Numenius phaeopus — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9483

Willet Tringa semipalmata — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Wrentit Chamaea fasciata — Breeds Mar 15 to Aug 10
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Yellow Rail Coturnicops noveboracensis — Breeds elsewhere
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9476

Yellow-billed Magpie Pica nuttalli — Breeds Apr 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9726

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# Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds.

**Probability of Presence** (■)

Each green bar represents the bird's relative probability of presence in your project's counties during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

**Breeding Season** (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

**Survey Effort** (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the counties of your project area. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

**No Data** (–)
A week is marked as having no data if there were no survey events for that week.

**Survey Timeframe**
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information.

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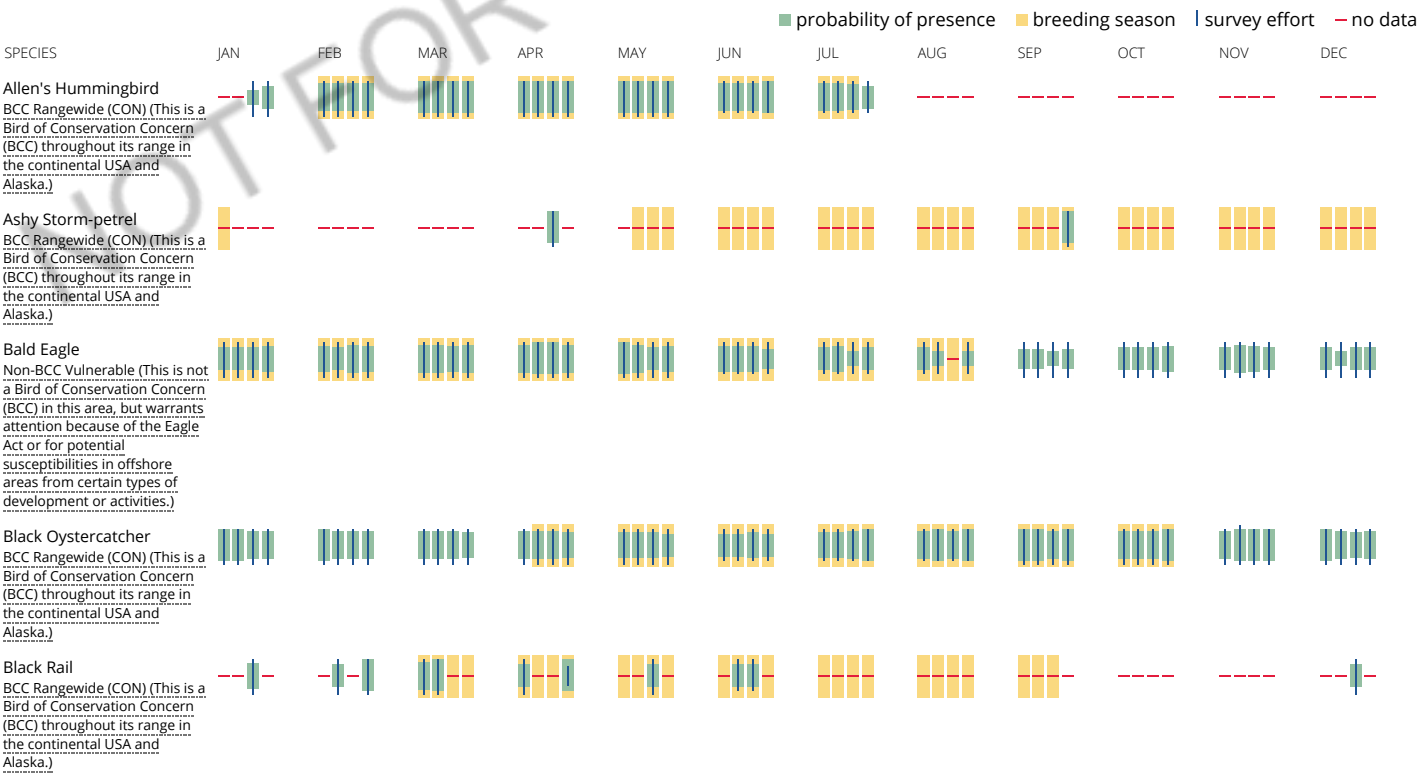


Black Skimmer
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Black Swift
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Black Turnstone
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Burrowing Owl
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

California Thrasher
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Clark's Grebe
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Costa's Hummingbird
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

SPECIES JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

Golden Eagle
Non-BCC Vulnerable (This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.)

Lawrence's Goldfinch
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Lewis's Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

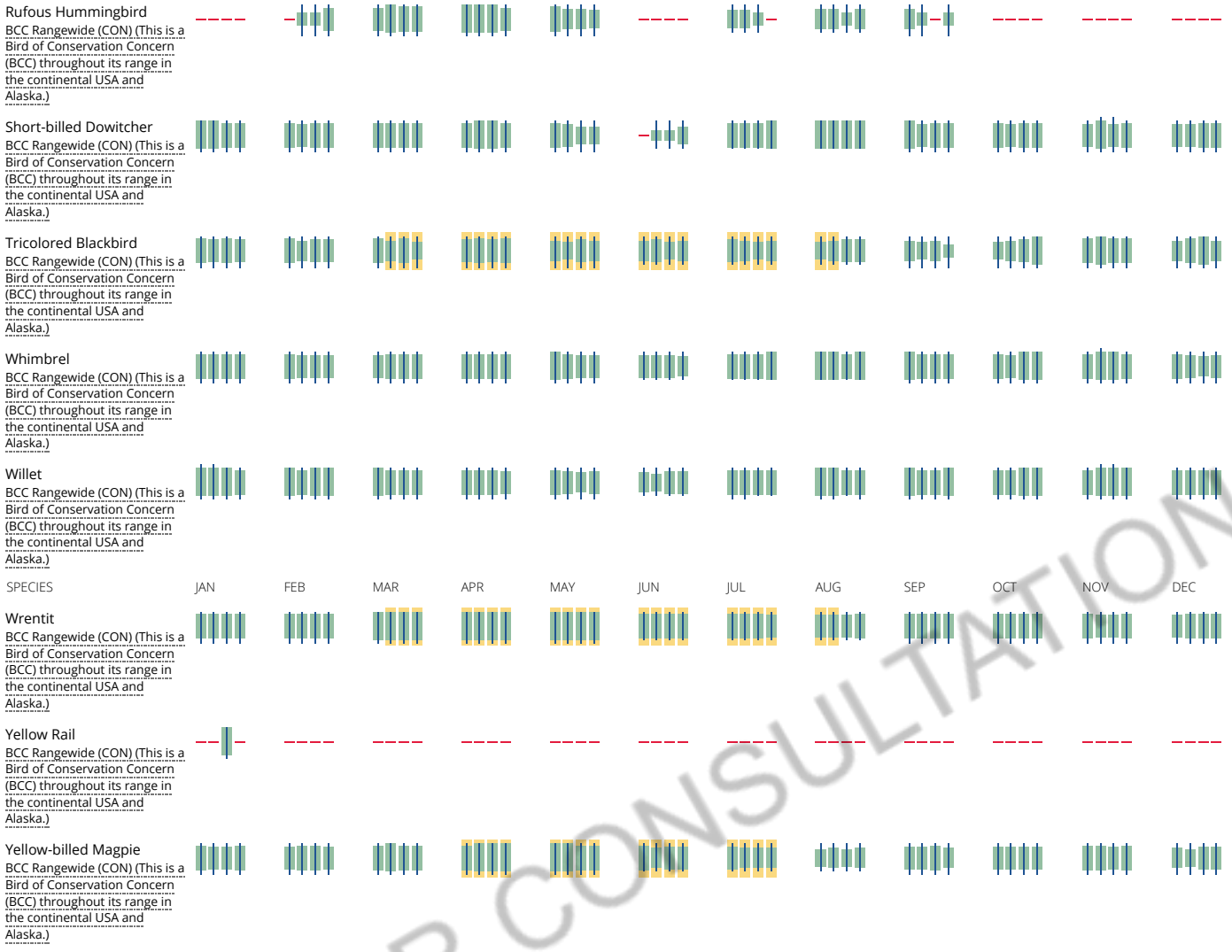
Long-billed Curlew
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Marbled Godwit
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

Nuttall's Woodpecker
BCC - BCR (This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA)

Oak Titmouse
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)

NOT FOR CONSULTATION

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**Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.**

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

**What does IPaC use to generate the migratory birds potentially occurring in my specified location?**

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the counties which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

**What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?**

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

**How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?**

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable that the bird breeds in your project's counties at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

**What are the levels of concern for migratory birds?**

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

**Details about birds that are potentially affected by offshore projects**

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

**What if I have eagles on my list?**

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the BGEPA should such impacts occur.

# Facilities

## National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

## Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

# Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEMA

FRESHWATER POND

PUBHh

A full description for each wetland code can be found at the National Wetlands Inventory website: https://ecos.fws.gov/ipac/wetlands/decoder

**Data limitations**

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

NOT FOR CONSULTATION

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

### Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

### Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

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# C.2 - Biotic Evaluation of Spotorno Ranch

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LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

# BIOTIC EVALUATION
# SPOTORNO RANCH

## CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA

By:


**LIVE OAK ASSOCIATES, INC.**

Rick Hopkins, Ph.D., Principal, Senior Ecologist
Pamela Peterson, Sr. Project Manager, Plant and Wetland Ecologist
Katrina Krakow M.S., Wildlife Ecologist


For:

Mike O'Hara
Tim Lewis Communities
3300 Douglas Blvd. Building 400,
Roseville, CA 95661

June 12, 2017 Project No. 1656-04


San Jose: 6840 Via del Oro, Suite 220 • San Jose, CA 95119 • Phone: (408) 224-8300 • Fax: (408) 224-1411
Oakhurst: P.O. Box 2697 • 39930 Sierra Way, Suite B • Oakhurst, CA 93644 • Phone: (559) 642-4880 • Fax: (559) 642-4883
Bakersfield: 8200 Stockdale Highway, M10-293 • Bakersfield, CA 93311

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# 1.0 INTRODUCTION

Live Oak Associates, Inc. (LOA) completed an analysis of the potential biological impacts of the 111-acre proposed Spotorno Ranch project. The Spotorno Ranch property is located on the east side of Alisal Street in the City of Pleasanton, Alameda County, California. The proposed project is the development of 39 homes and associated infrastructure on approximately 28 to 30 acres of the site, with the remaining approximately 81 acres set aside as a conservation area to be preserved in perpetuity under a deed restriction, conservation easement, or other similar conservation mechanism, with a habitat management plan (hereafter referred to as the "conservation area". The approximately 28 to 30-acre area proposed for development occurs in the lower and flatter western portion of the site near Alisal; while the proposed conservation area will occur within foothills in the eastern portion of the site above the 25% slope line. The site is bound by Alisal Street to the west and south, Westbridge Lane to the southeast, agricultural fields and residences to the north, and open rangelands to the east. The area of proposed development is primarily used as agricultural land for growing hay and the area proposed as a conservation area is used as rangeland for cattle.

This report analyzes potential impacts of future site development by the proposed Spotorno Ranch development on sensitive biotic resources, significant biotic habitats, regional fish and wildlife movement corridors, and existing local, state, and federal natural resource protection laws regulating land use. Provisions of the California Environmental Quality Act (CEQA), the federal Clean Water Act (CWA), the state and federal endangered species acts (CESA and FESA, respectively), California Fish and Wildlife Code, and California Water Code could greatly affect project costs, depending on the natural resources present on the site. The primary objectives of this report are as follows:

- Summarize all site-specific information related to existing biological resources;
- Make reasonable inferences about the biological resources that could occur on the site based on habitat suitability and the proximity of the site to a species' known range;
- Summarize all state and federal natural resource protection laws that may be relevant to possible future site development;
- Identify and discuss biological resource issues specific to the site that could constrain future development; and

- Identify potential avoidance, minimization and mitigation options that could significantly reduce the magnitude of any likely impacts to biological resources associated with future site development.

Natural resource issues related to these state and federal laws have been identified in past planning studies conducted in the general project area, and it is reasonable to presume that such issues could be relevant to the site examined in this report. A number of state and federally listed animals, as well as other special status animal species (i.e., candidate species for listing and California species of special concern) have been documented on the site or in close proximity to the site. These species include, but are not limited to, state and/or federally listed species such as the California tiger salamander and Callippe silverspot butterfly; California species of special concern including the burrowing owl and American badger; and rare plants including Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*). This report evaluates the site's suitability for these and other species.

CEQA is also concerned with project impacts on riparian habitat, wildlife movement corridors, fish and wildlife habitat, and jurisdictional wetlands, as well as project compliance with special ordinances and state laws protecting regionally sensitive biotic resources, including approved habitat conservation plans. Therefore, this report addresses the relevance of each of these issues to eventual site development.

The impact analysis discussed in Section 3.0 of this report is based on the known and potential biotic resources of the study area as discussed in Section 2.0 of this report. The evaluation of resources of the site is largely based on biological and wetland delineation survey work conducted on the site by LOA during the period from July 2012 through May 2017, as well as on a June 2008 Biological Resources Analysis prepared by Olberding Environmental, Inc. (Olberding Report). Other important sources of information used in the preparation of this analysis included: (1) the *California Natural Diversity Data Base* (CDFW 2017); (2) the *Online Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2017); (3) current listings from Special Plants and Animals (CDFW 2017); (4) numerous planning documents and biological studies for projects in the area, some of which have been prepared by LOA; (5) manuals and references related to plants and animals of the region; (6) a June 2016 site meeting with Keith Hess/USACE; and (7) an August 26, 2015 site meeting with Marcia Grefsrud/CDFW and subsequent follow up emails.

A number of state and federally listed species, as well as other special status species (i.e., candidate species for listing and California Species of Special Concern) have been documented in the vicinity of the project site. These include, but are not limited to, animals such as the Callippe silverspot butterfly (*Speyeria callippe callippe*), California tiger salamander (*Ambystoma californiense*), burrowing owl (*Athene cunicularia*), and American badger (*Taxidea taxus*); and plants such as Congdon's tarplant (*Centomadia parryi* ssp. *congdonii*). This report evaluates the project site's suitability as habitat for these and other species; impacts that may occur to these resources as a result of the project; and, where potentially significant impacts are identified, includes mitigations to lessen such impacts on these resources to a less-than-significant level.

### 1.1 Project Description

The proposed project includes construction of 39 single family homes on lots averaging 26,000 s.f. (0.6 acres), with a minimum lot size of 17,500 s.f. (0.4 acres). The homes will be clustered on approximately 28 to 30 acres on the low, flat portion of the site, below the 25% slope line, while approximately 81 acres of open space on the more visible foothills will be preserved as the most prominent feature of the site. The conservation area acreage is proposed to be preserved in perpetuity via the establishment of in a deed restriction, conservation easement, or similar conservation mechanism, along with a habitat management plan. Pedestrian access from Alisal will enter through a small passive park surrounding an existing wetland area near the western boundary of the site, and then continue on a trail through an open space parcel that runs between the homes in that portion of the site. The trail then continues to the open space area on the eastern side of the site, ultimately connecting to the open space to the north of the site. In addition to the homes, trails and associated infrastructure, the project will include the stabilization of a portion of the slopes occurring to the east of the development and above the 25% slope line, approximately 4.25 acres.

The project proposal includes a General Plan Amendment and corresponding amendment to the Happy Valley Specific Plan (HVSP) which would:

a) change the MDR designation on the upper lots to Open Space, and
b) change the SRDR designation on the Flats area to LDR.

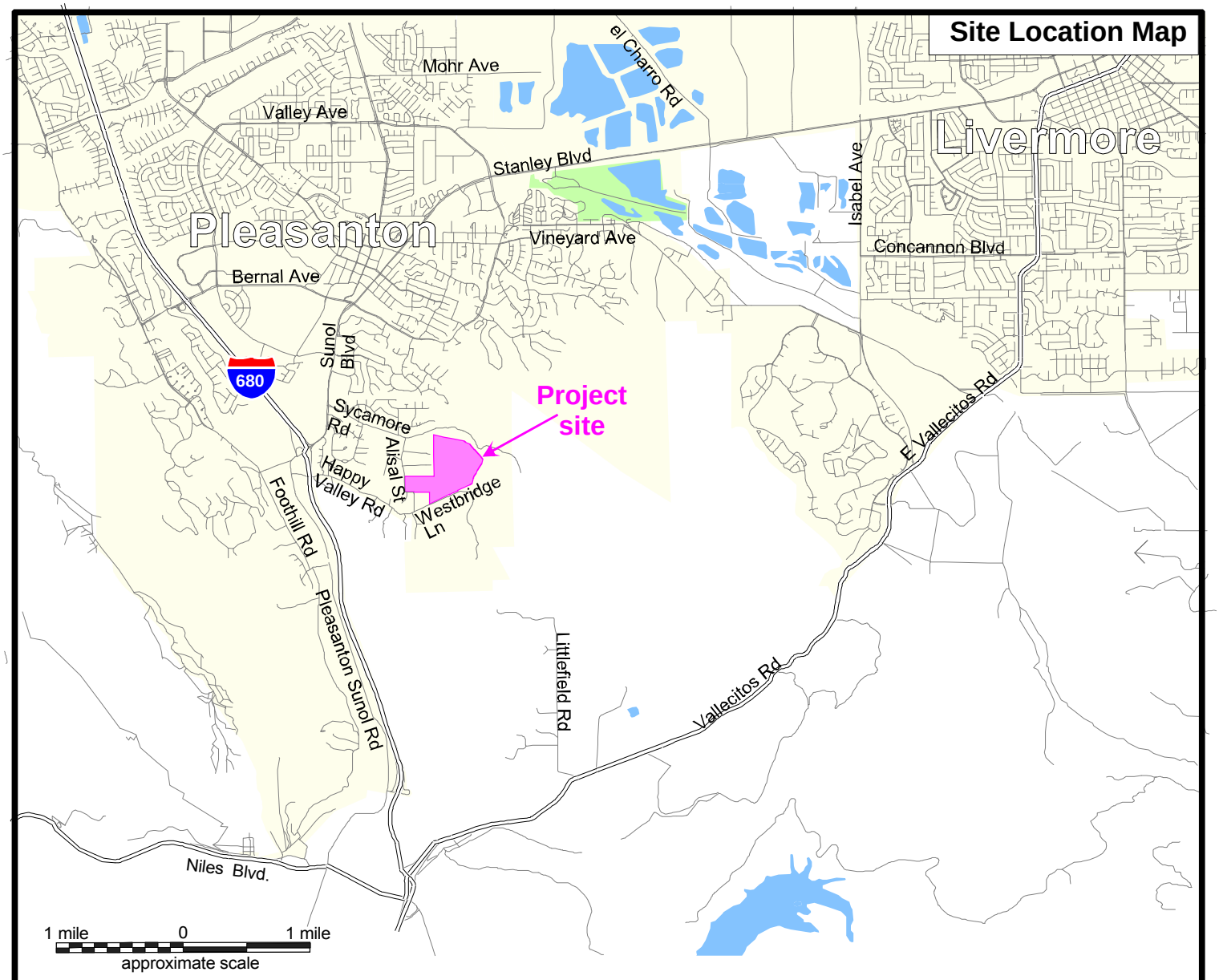
Coincident with these actions, the proposed zoning would also be changed to delete the 75 PUD-MDR lots from the hillside (rezoning to PD- Open Space), and a change in the zoning of the Spotorno Flats area from PUD-SRDR to PUD-LDR.

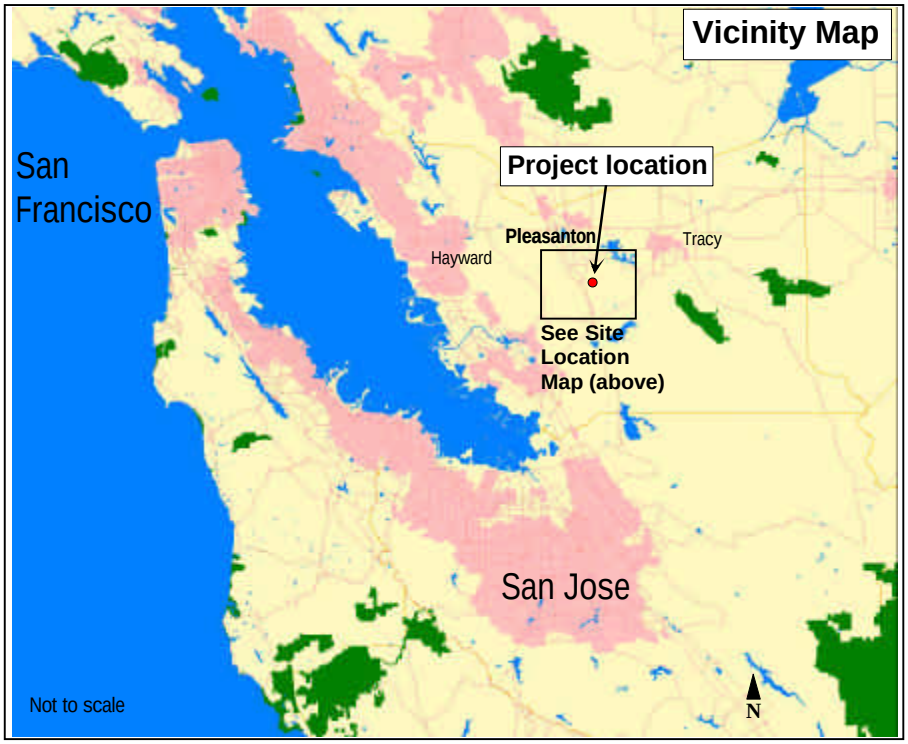
## 2.0 EXISTING CONDITIONS

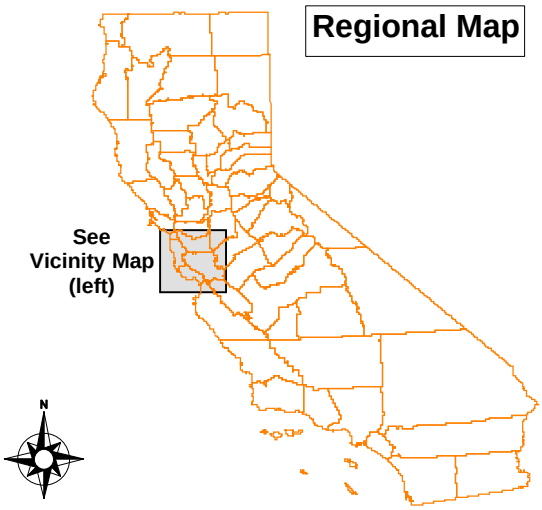
### *Regional Setting*

The 111-acre Spotorno Ranch project site is located within the City of Pleasanton (Figure 1) in the Livermore 7.5" U.S. Geological Survey (USGS) quadrangle (Figure 2). The approximately 28 to 30-acre development area is bound by Alisal Street to the west and south, Westbridge Lane to the southeast, agricultural fields and residences to the north, and open rangelands to the east. The site is used primarily as agricultural lands for growing hay and as rangeland for cattle. Topographically, the western portion of the site is fairly level at approximately 380 feet (116 meters) with an increase in slope towards the eastern edge to approximately 480 feet (147 meters) National Geodetic Vertical Datum (NGVD). Surrounding land uses are primarily open space/agricultural (i.e. rangeland), residential, golf course, and major and minor roadways.

Four soil-mapping units have been identified on the site and these soils are described in greater detail in Table 1 and depicted in Figure 3. None of the soils of the site are considered hydric soils, i.e. soils that under appropriate hydrological conditions may support wetlands, however, hydric inclusions may occur. All of the soil types of the project site are considered well-drained. None of the soils of the site is a serpentine or alkaline soil, therefore, they would not be expected to support special status plant species that are endemic to serpentine or alkaline soils.



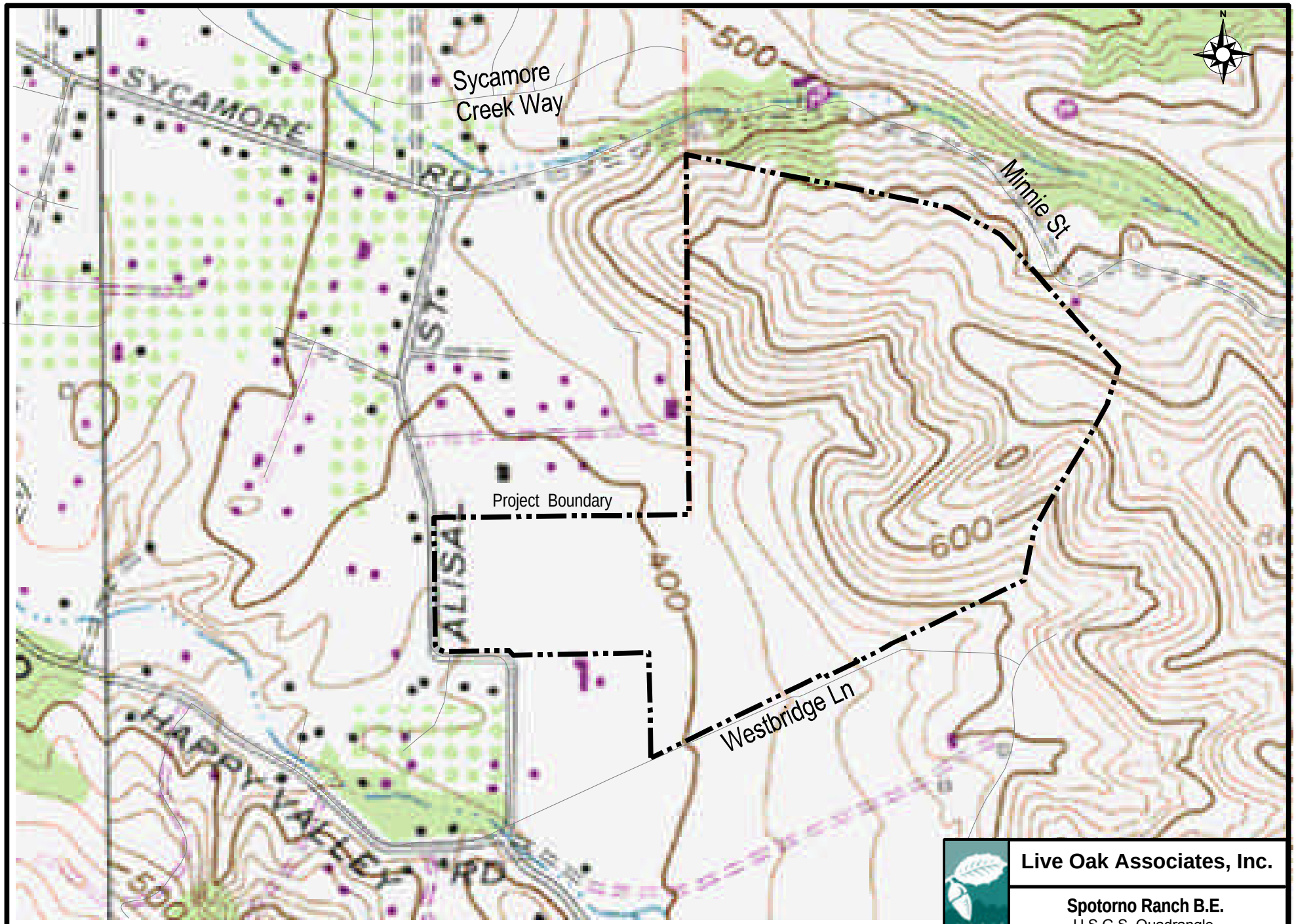




**Live Oak Associates, Inc.**

**Spotorno Ranch B.E.**
Site / Vicinity Map

| Date | Project # | Figure # |
|---|---|---|
| 4/4/2017 | 1656-04 | 1 |




1,000' 0 1,000 feet
approximate scale

From USGS
Livermore 7.5' Quadrangle 1980

**Live Oak Associates, Inc.**

**Spotorno Ranch B.E.**
U.S.G.S. Quadrangle

| Date | Project # | Figure # |
|---|---|---|
| 4/4/2017 | 1656-04 | 2 |

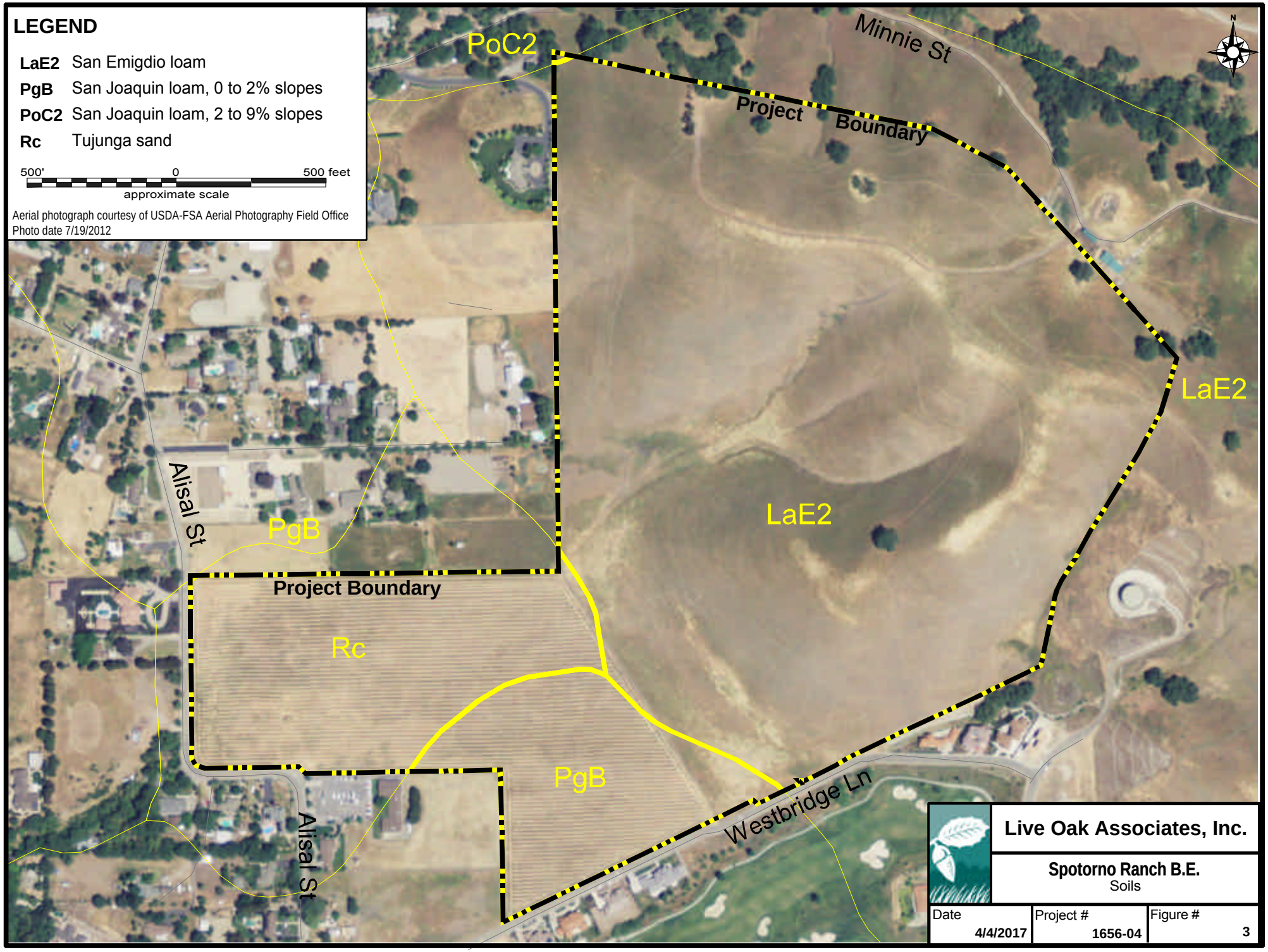

LEGEND
LaE2 San Emigdio loam
PgB San Joaquin loam, 0 to 2% slopes
PoC2 San Joaquin loam, 2 to 9% slopes
Rc Tujunga sand
500' 0 500 feet
approximate scale
Aerial photograph courtesy of USDA-FSA Aerial Photography Field Office
Photo date 7/19/2012
PoC2
Minnie St
Project Boundary
LaE2
LaE2
Alisal St
PgB
Project Boundary
Rc
PgB
Westbridge Ln
Alisal St
N
Live Oak Associates, Inc.
Spotorno Ranch B.E.
Soils
Date 4/4/2017
Project # 1656-04
Figure # 3

**Table 1. Descriptions of soil mapping units of the study area (USDA NRCS Web Soil Survey).**

| Soil Series/Soil | Map Unit Symbol | Parent Material | Drainage Class | % Hydric Composition |
|---|---|---|---|---|
| SAN EMIGDIO SERIES San Emigdio Loam | LaE2 | Sedimentary alluvium | Well-drained | 0 |
| SAN JOAQUIN SERIES San Joaquin loam, 0-2% slopes | PgB | alluvium derived from mixed but dominantly granitic rock sources | Well and moderately well-drained | 0 |
| San Joaquin loam, 2-9% slopes | PoC2 | alluvium derived from mixed but dominantly granitic rock sources | Well and moderately well-drained | 0 |
| TUJUNGA SERIES Tujunga sand | Rc | alluvium from granitic sources | Somewhat excessively drained | 0 |

http://soils.usda.gov/technical/classification/osd/index.html

The East Bay Area has a Mediterranean climate with warm to hot, dry summers and cool winters. Annual precipitation in the general vicinity of the site is highly variable from year to year, but average annual rainfall is approximately 16 inches, most of which falls between October and April. Stormwater runoff readily infiltrates the site's soils; but when field capacity has been reached, gravitational water either drains to an intermittent tributary of Sycamore Creek in the northern portion of the site, or drains to the existing wetlands in the lowest portion of the site near Alisal where it eventually flows into a roadside ditch along Alisal and into an underground culvert.

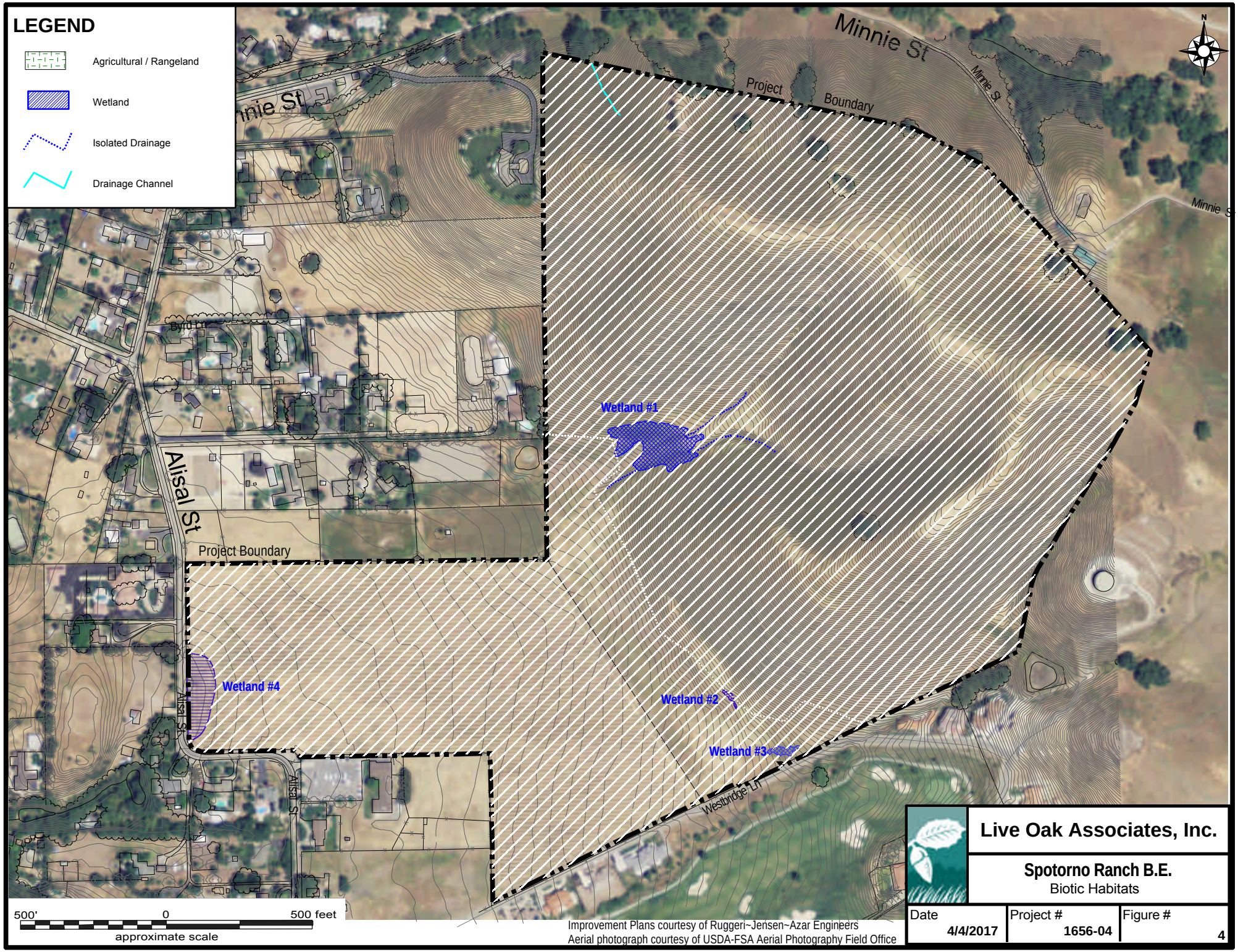
## 2.1 BIOTIC HABITATS/LAND USES

Biotic habitats and land uses identified on the site include Agricultural/Rangeland, Intermittent Drainage, and Seasonal Wetland (including both isolated and non-isolated wetlands) (Figure 4). These are described in greater detail below.

### 2.1.1 Agricultural/Rangeland

Agricultural/Rangeland is the largest biotic habitat of the site. The flatter portion of this habitat in the western portion of the site is used to grow hay. The hay is cut and raked, and then cattle are moved into this portion of the ranch to eat the cut hay. This portion of the site is disced on a regular basis. The upper eastern portion of this habitat is used only as rangeland. Vegetation does not appear to differ significantly between the Agricultural and Rangeland portions of this habitat. Vegetation of the Agricultural/Rangeland habitat includes wild oats (*Avena* sp.), soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis ssp. rubens*), Italian thistle (*Carduus pycnocephalus*), yellow star thistle (*Centaurea solstitialis*), bull thistle (*Cirsium vulgare*), bindweed (*Convolvulus arvensis*), dove weed (*Croton setigerus*), goldenbush (*Ericameria sp.*), filaree (*Erodium sp.*), bristly ox tongue (*Helminthotheca echioides*), tarweed (*Hemizonia sp.*), summer mustard (*Hirschfeldia incana*), barley (*Hordeum marinum*), willowleaf lettuce (*Lactuca saligna*), prickly lettuce (*Lactuca serriola*), bird's foot trefoil (*Lotus corniculatus*), curly dock (*Rumex crispus*), milk thistle (*Silybum marianum*), and purple salsify (*Tragopogon porrifolius*), to name a few.

In addition, an agricultural ditch exists along the northern site boundary that is approximately one to one and a half feet deep, and from one and a half to two feet wide. This ditch is fully vegetated with the same upland vegetation occurring in the rest of the Agricultural/Rangeland habitat with the addition of a small amount of sowthistle (*Sonchus asper*). The ditch does not appear to hold water for any length of time and appears to transport runoff from intermittent drainages of the site to a roadside ditch along Alisal Street which eventually is carried under Alisal Street via a culvert to a riparian area on the other side. This feature has been completely dry during all of LOA's site visits.




Improvement Plans courtesy of Ruggeri~Jensen~Azar Engineers
Aerial photograph courtesy of USDA-FSA Aerial Photography Field Office

During LOA's first survey in 2012, LOA ecologist Katrina Krakow observed a few individual Congdon's tar plants (*Centromadia parryi ssp. congdonii*) that were not in bloom and just emerging. Congdon's tarplant is a special status plant species and a focal species of the East Alameda County Conservation Strategy (EACCS). The plants were observed near the large wetland area (Wetland #4) adjacent to Alisal, as well as within a small area further east of an existing windmill in a location not associated with wetlands. This species has not been observed on the site in follow-up site visits in 2014, 2015, 2016 or 2017, although not all site visits occurred during this species' blooming season. A focused survey for this species is planned to be conducted in summer and fall 2017. This species will be discussed in greater detail later on in this report.

Wildlife observed in this habitat on the site during 2012 through 2017 surveys included reptiles such as the western fence lizard (*Sceloporus occidentalis occidentalis*), western yellow-bellied racer (*Coluber constrictor mormon*), and northern Pacific rattlesnake (*Crotalus oreganus oreganus*) (identified by remains of a shedded skin); birds including the turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), unidentified gull species, killdeer (*Charadrius vociferus*), northern mockingbird (*Mimus polyglottos*), American crow (*Corvus brachyrhynchos*), barn swallow (*Hirundo rustica*), western blue bird (*Sialia mexicana*), and house finch (*Carpodacus mexicanus*); and mammals including the Botta's pocket gopher (*Thomomys bottae*)(presence of burrows), and black-tailed deer (*Odocoileus hemionus columbianus*). Other mammals including California voles (*Microtus californicus*), domestic cats (*Felis catus*), and domestic dogs (*Canis familiaris*) are likely to occur on the site as well.

Medium-sized and larger mammals that have not been directly observed but which may occur on the site include cottontail (*Sylvilagus audubonii*), black-tailed hare (*Lepus californicus*), coyote (*Canis latrans*), native gray fox (*Urocyon cinereoargenteus*), American badger, striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphis virginiana*), raccoon (*Procyon lotor*), and introduced red fox (*Vulpes vulpes*).

### 2.1.2 Intermittent Drainage

Intermittent drainages occur within the proposed open space areas of the site, including a short reach of channel (205 linear feet) which is a tributary of Sycamore Creek in the northern portion

of the site, and three reaches of isolated intermittent drainages (totaling 692 linear feet) that occur in the central portion of the open space area. These channels have been observed to be completely dry during numerous site visits conducted between 2014 and 2017, and are either barren of vegetation or support primarily upland species such as wild oats, soft chess, bull thistle, bindweed, Bermuda grass (*Cynodon dactylon*), spike rush, Italian rye grass (*Festuca perennis*), summer mustard, barley, prickly lettuce, bird's foot trefoil, milk thistle, and clover (*Trifolium sp.*). Wildlife expected to occur in the adjacent grassland habitats would be expected use this habitat type as well.

### 2.1.3 Seasonal Wetland

Four seasonal wetlands occur on the site. Three of these wetlands, totaling 0.85 acres are isolated and occur on slopes within the open space areas of the site, at or above the 25% slope line. Slope stabilization occurring within the open space area will impact one of these wetlands (Wetland 2, totaling 0.02 acre). The fourth wetland (0.45 acres) occurs near the site's boundary near Alisal Street.

Hydrophytic species dominant in these seasonal wetland areas, along with their wetland indicators, included Mediterranean canary grass (*Phalaris arundinacea*) (FACW) and Mediterranean barley (*Hordeum marinum*) (FAC). Wetlands of the site have been completely dry during all site visits from 2014 through 2016. Wildlife expected to use the seasonal wetlands of the site would be similar to those described in adjacent habitats.

## 2.2 MOVEMENT CORRIDORS

Ecologists and conservation biologists have expended a great deal of energy since the early 1980's advocating the protection and restoration of landscape linkages among suitable habitat patches. Movement corridors or landscape linkages are usually linear habitats that connect two or more habitat patches (Harris and Gallager 1989), providing assumed benefits to the species by reducing inbreeding depression, and increasing the potential for recolonization of habitat patches. Some researchers have even demonstrated that poor quality corridors can still provide some benefit to the species that use them (Beier 1996).

Beier and Noss (1998) evaluated the claims of the efficacy of wildlife corridors of 32 scientific papers. In general, these authors believed that the utility of corridors was demonstrated in fewer than half of the reviewed papers, and they believed that study design played a role in whether or not given corridors were successful. Examples of well-designed studies supported the value of corridors. They believed, however, that connectivity questions make sense only in terms "of a particular focal species and landscape." For example, volant (flying) species are less affected by barriers then small, slow moving species such as frogs or snakes (Beier and Noss 1998). In addition, large mammals such as carnivores that can move long distances in a single night (e.g., cougars) are more capable of making use of poor quality or inhospitable terrain than species that move more slowly and can easily fall prey to various predators or that are less able to avoid traffic or other anthropogenic effects (Beier 1996). Therefore, it is reasonable to conclude that landscape linkages, even poor ones, can be and are useful, especially for terrestrial species.

Therefore, while the importance of landscape linkages is well demonstrated in the scientific literature, the cautionary note of Beier and Noss (1998) that consideration of context and ecological scale are also of critical importance in evaluating linkages.

Habitat corridors are vital to terrestrial animals for connectivity between core habitat areas (i.e., larger intact habitat areas where species make their living). Connections between two or more core habitat areas help ensure that genetic diversity is maintained, thereby diminishing the probability of inbreeding depression and geographic extinctions.

The quality of habitat within the corridors is important: "better" habitat consists of an area with a minimum of human interference (e.g., roads, homes, etc.) and is more desirable to more species than areas with sparse vegetation and high-density roads. Movement corridors in California are typically associated with valleys, rivers and creeks supporting riparian vegetation, and ridgelines. With increasing encroachment of humans on wildlife habitats, it has become important to establish and maintain linkages, or movement corridors, for animals to be able to access locations containing different biotic resources that are essential to maintaining their life cycles.

Healthy riparian areas (supporting structural diversity, i.e., understory species to saplings to mature riparian trees) have a high biological value as they not only support a rich and diverse

wildlife community but have also been shown to facilitate regional wildlife movement. Riparian areas can vary from tributaries winding through scrubland to densely vegetated riparian forests.

A riparian zone can be defined as an area that has a source of fresh water (e.g., rill, stream, river), a defined bank, and upland areas consisting of moist soils (e.g., wetter than would be expected simply due to seasonal precipitation). These areas support a characteristic suite of vegetative species, many of which are woody, that are adapted to moister soils. Such vegetation in the project region may include California buckeye (*Aesculus californica*), dogwood (*Cornus* sp.), California hazelnut (*Corylus cornuta* var. *californica*), elderberry (*Sambucus* sp.), Oregon ash (*Fraxinus latifolia*), walnut (*Juglans* sp.), California laurel (*Umbellularia californica*), toyon (*Heteromeles arbutifolia*), oaks (*Quercus* sp.), and willow (*Salix* sp.).

Beier and Loe (1992) noted five functions of corridors (rather than physical traits) that are relevant when conducting an analysis regarding the value of linkages. The following five functions should be used to evaluate the suitability of a given tract of land for use as a habitat corridor:

1.) Wide ranging mammals can migrate and find mates;
2.) Plants can propagate within the corridor and beyond;
3.) Genetic integrity can be maintained;
4.) Animals can use the corridor in response to environmental changes or a catastrophic event;
5.) Individuals can recolonize areas where local extinctions have occurred.

A corridor is “wide enough” when it meets these functions for the suite of animals in the area. It is important to note that landscape linkages are used differently by different species. For instance, medium to large mammals (or some bird species) may traverse a corridor in a matter of minutes or hours, while smaller mammals or other species may take a longer period of time to move through the same corridor (e.g., measured in days, weeks and even years). For example, an individual cougar may traverse the entire length of a long narrow corridor in an hour while travel of smaller species (such as rodent or rabbit species) may best be measured as gene flow within regional populations. These examples demonstrate that landscape linkages are not simply highways that animals use to move back and forth. While linkages may serve this purpose, they also allow for slower or more infrequent movement. Width and length must be considered in

evaluating the value of a landscape linkage. A long narrow corridor would most likely only be useful to wide ranging animals such as cougars and coyotes when moving between core habitat areas.

To the extent practicable, conservation of linkages should address the needs of "passage species" (those species that typically use a corridor for the primary purpose of moving from one intact area to another) *and* "corridor dwellers" (such as plants and some slow moving species such as amphibians and reptiles that require days or generations to move through the corridor).

While no detailed study of animal movements has been conducted for the study area, knowledge of the site, its habitats, and the ecology of the species potentially occurring onsite permits sufficient predictions about the types of movements occurring in the region and whether or not proposed development would constitute a significant impact to animal movements.

As noted in Section 2.1, a number of reptiles, birds, and mammals may use the project site as part of their home range and dispersal movements. Creeks and drainages are known to facilitate wildlife movement, however, the intermittent channels of the site occur within the open space area of the site and will not be impacted by the project. Further, these drainages are unlikely to provide significant movement habitat for wildlife as they do not support riparian vegetation and do not appear to provide a link between important habitats. For instance, with the exception of the drainage in the northernmost portion of the site which connects to Sycamore Creek, the other drainages originate within and dissipate into upland grassland habitat and are not connected to any other creeks or drainages.

## 2.3 SPECIAL STATUS PLANTS AND ANIMALS

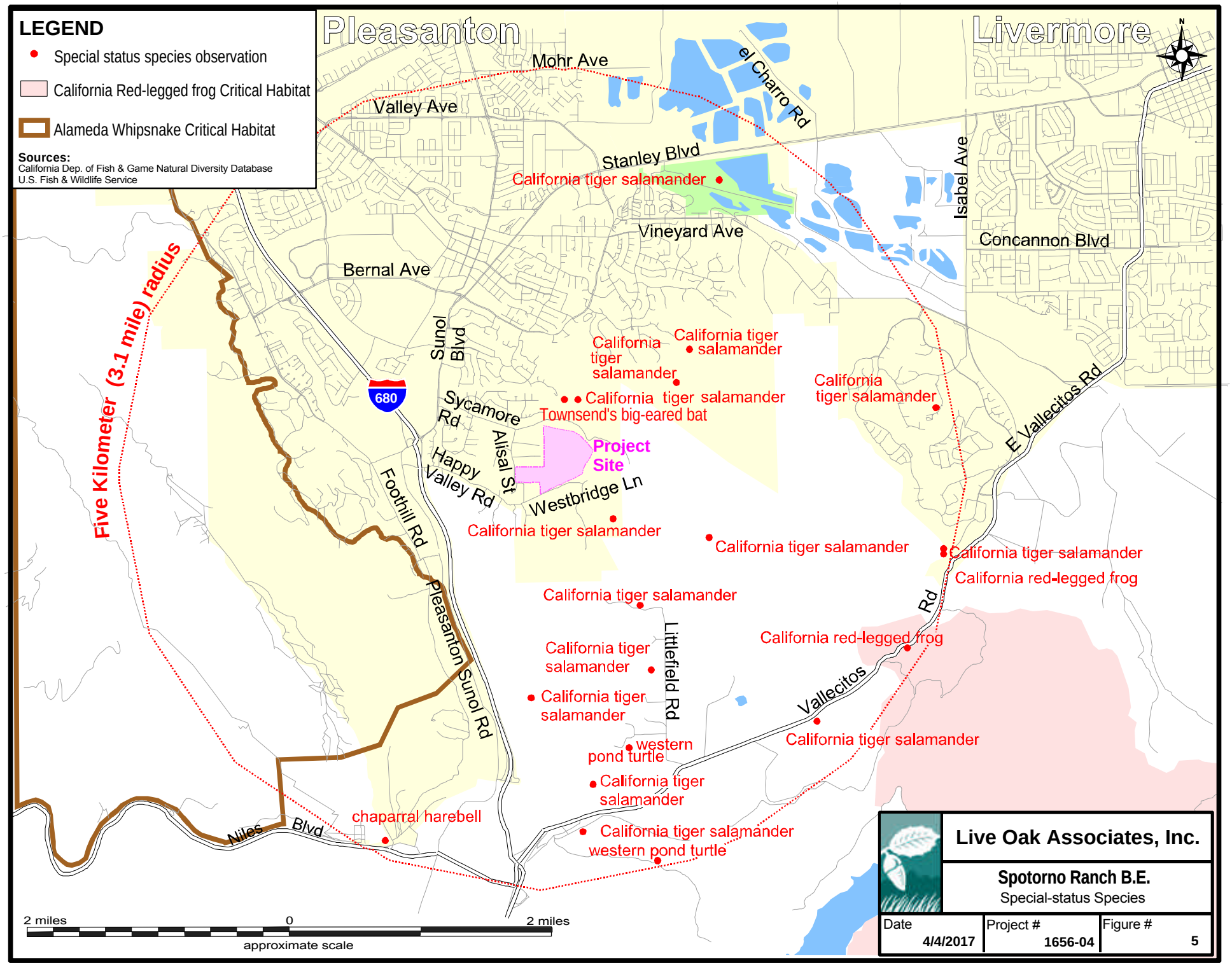
Several species of plants and animals within the state of California have low populations, limited distributions, or both. Such species may be considered "rare" and are vulnerable to extirpation as the state's human population grows and the habitats these species occupy are converted to agricultural and urban uses. As described more fully in Section 3.2, state and federal laws have provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting the diversity of plant and animal species native to the state. A sizable number of native plants and animals have been

formally designated as threatened or endangered under state and federal endangered species legislation, others have been designated as "candidates" for such listing, and still others have been designated as "species of special concern" by the CDFW. The California Native Plant Society (CNPS) has developed its own set of lists of native plants considered rare, threatened, or endangered (CNPS 2017). Collectively, these plants and animals are referred to as "special status species."

A number of special status plants and animals occur in the vicinity of the site (Figure 5). These species and their potential to occur in the study area are listed in Table 2 on the following pages. Sources of information for this table included *California's Wildlife, Volumes I, II, and III* (Zeiner et. al 1988), *California Natural Diversity Data Base* (CDFW 2017), *Endangered and Threatened Wildlife and Plants* (USFWS 2017), *State and Federally Listed Endangered and Threatened Animals of California* (CDFW 2017), and *The California Native Plant Society's Inventory of Rare and Endangered Vascular Plants of California* (CNPS 2017). This information was used to evaluate the potential for special status plant and animal species to occur onsite.

A search of published accounts for all relevant special status plant and animal species was conducted for the Livermore USGS 7.5" quadrangle in which the project site occurs and for the eight surrounding quadrangles (Diablo, Tassajara, Byron Hot Springs, Dublin, Altamont, Niles, La Costa Valley, and Mendenhall Springs) using the California Natural Diversity Data Base (CNDDB) Rarefind (CDFW 2017). These species and their potential to occur in the study area are summarized in Table 2 below. Figure 5 depicts documented occurrences of special status species within 3 miles of the site and Figure 6 depicts documented occurrences of San Joaquin kit fox within 10 miles of the site. All plant species listed as occurring in these quadrangles on CNPS Lists 1A, 1B, 2, or 4 were also reviewed.

Special status species with potential to occur on the project site itself or in the immediate surrounding vicinity are discussed further below.


LEGEND
Special status species observation
California Red-legged frog Critical Habitat
Alameda Whipsnake Critical Habitat
Sources:
California Dep. of Fish & Game Natural Diversity Database
U.S. Fish & Wildlife Service
Pleasanton
Livermore
N
Mohr Ave
Valley Ave
el Charro Rd
Stanley Blvd
California tiger salamander
Isabel Ave
Vineyard Ave
Concannon Blvd
Bernal Ave
Five Kilometer (3.1 mile) radius
Sunol Blvd
California tiger salamander
California tiger salamander
California tiger salamander
California tiger salamander
Townsend's big-eared bat
680
Sycamore Rd
Alisal St
Project Site
Happy Valley Rd
Westbridge Ln
Foothill Rd
California tiger salamander
California tiger salamander
California tiger salamander
California red-legged frog
E Vallecitos Rd
California tiger salamander
Pleasanton Sunol Rd
Littlefield Rd
California red-legged frog
Vallecitos Rd
California tiger salamander
California tiger salamander
California tiger salamander
western pond turtle
California tiger salamander
California tiger salamander
western pond turtle
chaparral harebell
Niles Blvd
2 miles
0
2 miles
approximate scale
Live Oak Associates, Inc.
Spotorno Ranch B.E.
Special-status Species
Date 4/4/2017
Project # 1656-04
Figure # 5

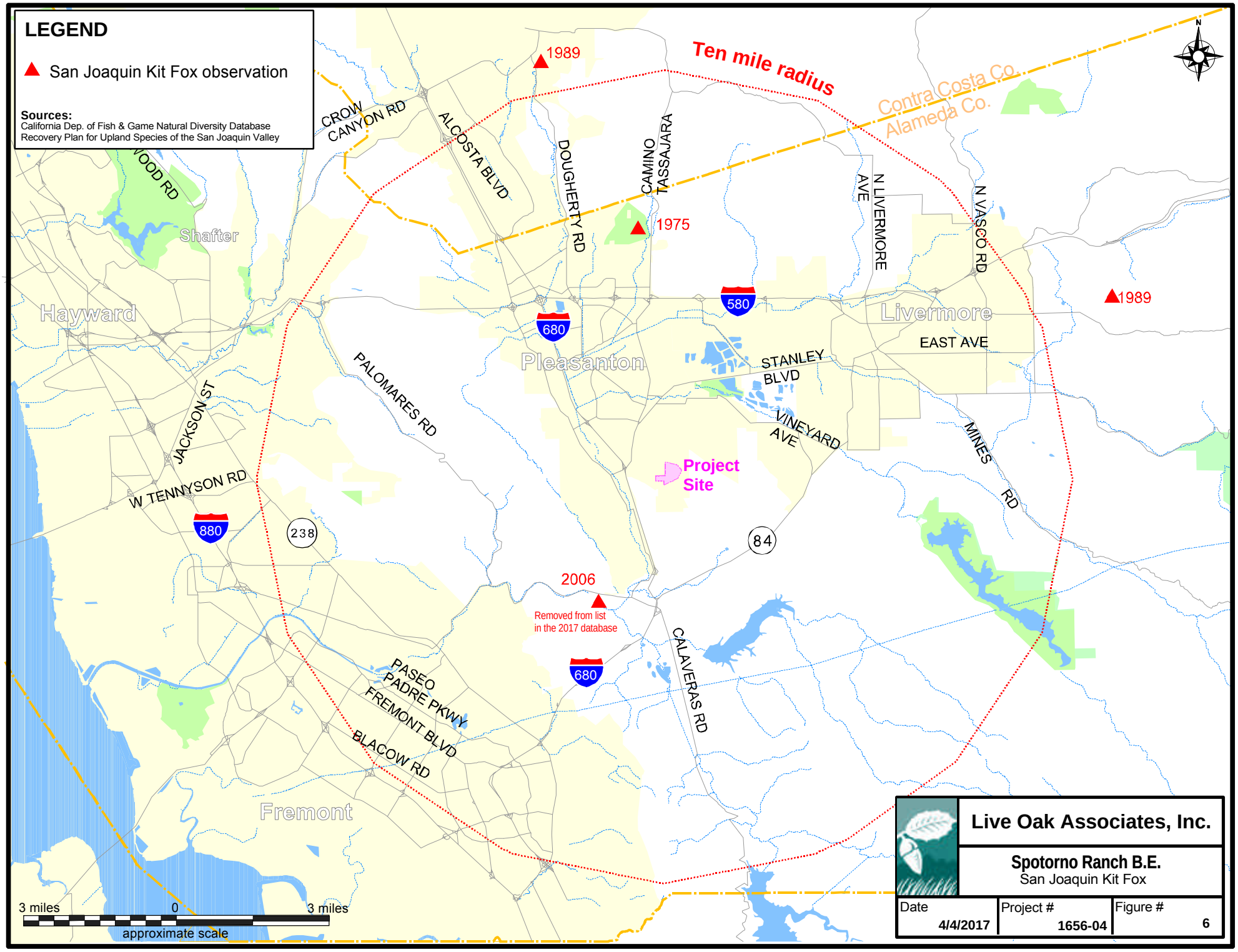

LEGEND
San Joaquin Kit Fox observation
Sources:
California Dep. of Fish & Game Natural Diversity Database
Recovery Plan for Upland Species of the San Joaquin Valley
Ten mile radius
Contra Costa Co.
Alameda Co.
1989
1975
1989
2006
Removed from list in the 2017 database
Project Site
Hayward
Shafter
Pleasanton
Livermore
Fremont
CROW CANYON RD
ALCOSTA BLVD
DOUGHERTY RD
CAMINO TASSAJARA
N LIVERMORE AVE
N VASCO RD
EAST AVE
STANLEY BLVD
VINEYARD AVE
MINES RD
PALOMARES RD
JACKSON ST
W TENNYSON RD
PASEO PADRE PKWY
FREMONT BLVD
BLACOW RD
CALAVERAS RD
580
680
880
238
84
3 miles
0
3 miles
approximate scale
Live Oak Associates, Inc.
Spotorno Ranch B.E.
San Joaquin Kit Fox
Date 4/4/2017
Project # 1656-04
Figure # 6

**Table 2: Special status species that could occur in the project vicinity.**
**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Large-flowered Fiddleneck (*Amsinckia grandiflora*) | FE, CE, CNPS 1B | Habitat: Occurs in cismontane woodlands and valley and foothill grasslands. Elevation: 275-550 meters. Blooms: Annual herb; April-May. | **Absent.** The site supports grasslands that may provide suitable habitat for this species; however, this species occurs at much higher elevations than the site; there are no documented occurrences within three miles of the site; and the species was not observed during focused surveys in May 2017. |
| Palmate-bracted bird's-beak (*Choropyron palmatum*) | FE, CE CNPS 1B | Habitat: Occurs in saline/alkaline soils of seasonally flooded lowlands and basins, including chenopod scrub. Hemiparasitic on chenopod and saltmarsh species. Elevation: 1-155 meters. Blooms: May-October. | **Absent.** Suitable habitat is absent from the site. There are no documented occurrences within three miles of the site. |
| Livermore tarplant (*Deinandra bacigalupii*) | CCE CNPS 1B | Habitats: Occurs in alkaline soils in meadows and seeps. Elevation: 150-185 meters. Blooms: June-October. | **Unlikely.** The grasslands of the site provide marginal habitat for this species due to an absence of highly alkaline soils. There are no documented occurrences within three miles of the site. A rare plant survey will be conducted in summer and fall 2017. |
| California seablite (*Suaeda californica*) | FE, CNPS 1B | Habitat: Occurs in coastal salt marshes and swamps. Elevation: 0-15 meters. Blooms: July-October | **Absent.** Habitat for this species is absent from the site. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Slender silver moss (*Anomobryum julaceum*) | CNPS 2 | Habitat: Occurs on damp rock and soil outcrops, usually on roadcuts, in broadleaf upland forest, lower montane coniferous forest, and north coast coniferous forest. Elevation: 100-1000 meters. | **Absent.** Habitat for this species is absent from the site. There are no documented occurrences within three miles of the site. |
| Mt. Diablo manzanita (*Arctostaphylos auriculata*) | CNPS 1B | Habitat: Occurs in chaparral habitats on sandstone. Elevation: 120-500 meters. Blooms: Evergreen shrub; January-March. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Contra Costa manzanita (*Arctostaphylos manzanita* ssp. *laevigata*) | CNPS 1B | Habitat: Occurs in rocky chaparral habitats. Elevation: 500-1100 meters. Blooms: Evergreen shrub; January-February. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Alkali milk-vetch (*Astragalus tener* var. *tener*) | CNPS 1B | Habitat: Occurs in alkaline soils within low-lying areas, playas, vernal pools and annual grasslands. Elevation: 1-60 meters. Blooms: Annual; March – June. | **Absent.** The grasslands and seasonal wetlands of the site provide only marginal habitat for this species due to an absence of highly alkaline soils and this species has not been observed in the vicinity since 1989. There are no documented occurrences within three miles of the site and this species was not observed during focused surveys conducted in May 2017. |
| Heartscale (*Atriplex cordulata*) | CNPS 1B | Habitat: Occurs in saline or alkaline soils of chenopod scrub, meadows and seeps, and sandy valley and foothill grassland. Elevation: 0-560 meters. Blooms: April-October. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Brittlescale (*Atriplex depressa*) | CNPS 1B | Habitat: Occurs on alkaline clay soils in chenopod scrub, meadows and seeps, playas, valley and foothill grasslands, and vernal pools. Elevation: 1-320 meters. Blooms: Annual herb; April-October. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Lesser saltscale (*Atriplex minuscula*) | CNPS 1B.1 | Habitat: Occurs in alkaline and sandy soils in chenopod scrub, playas, and valley and foothill grasslands. Elevation: 15-200 meters Blooms: Annual herb; May-October. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Big-scale balsamroot (*Balsamorhiza macrolepis* var. *macrolepis*) | CNPS 1B | Habitat: Occurs in chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentine. Elevation: 90-1400 meters. Blooms: Perennial herb; March-June. | **Absent.** While grasslands of the site provide potentially suitable habitat for this species, soils of the site are not serpentine and this perennial plant would have been identified if present on the site during the 2012 through 2017 surveys, including a focused rare plant survey in May 2017. There are no documented occurrences within three miles of the site. |
| Big tarplant (*Blepharizonia plumosa*) | CNPS 1B | Habitat: Occurs in valley and foothill grasslands, usually on clay or clay-loam soils. Elevation: 30-505 meters. Blooms: Annual; July-October. | **Possible.** Potentially suitable habitat occurs within the grasslands of the site on clay-loam soils. Properly timed surveys would need to be conducted to determine its presence or absence from the site. A focused survey for this species is planned in summer and fall 2017. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Round-leaved filaree (*California macrophylla*) | CNPS 1B | Habitat: Occurs on clay soils in cismontane woodlands and valley and foothill grasslands. Elevation: 15-1200 meters. Blooms: Annual; March to May. | **Absent.** Potentially suitable habitat occurs within the grasslands of the site, however, the species was not detected during a focused survey conducted in May 2017 and it is presumed absent from the site. There are no documented occurrences within three miles of the site. |
| Mt. Diablo fairy-lantern (*Calochortus pulchellus*) | CNPS 1B | Habitat: Occurs on wooded or brushy slopoes within chaparral, cismontane woodland, riparian woodland, and valley and foothill grasslands. Elevation: 30-840 meters. Blooms: Bulb; April-June. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Chaparral harebell (*Campanula exigua*) | CNPR 1B | Habitat: Occurs in rocky chaparral, usually on serpentine. Elevation: 300-1250 meters. Blooms: Annual herb; May-November. | **Absent.** Habitat is absent on the site for this species. There is one documented occurrence of this species in the site's vicinity approximately three miles south of the site near Niles Blvd. |
| Congdon's tarplant (*Centromadia parryi ssp. congdonii*) | CNPS 1B | Habitat: Occurs on valley and foothill grasslands on alkaline soils. Elevation: 0-230 meters. Blooms: Annual herb; May-November. | **Possible.** The 2008 Olberding Report identified a population of Congdon's tarplant on the site and LOA identified three very small populations on the site during their July 9, 2012 site visit; however, this species has not been observed on the site during surveys conducted in 2014 through 2017. A focused survey for this species is planned in summer and fall 2017. |
| Hispid bird's-beak (*Chloropyron mollis* ssp. *hispidus*) | CNPS 1B | Habitats: Occurs in alkaline soils in meadows and seeps, playas, and valley and foothill grassland. Elevation: 1-155 meters. Blooms: Annual; June-September. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*) | CNPS 4 | Habitats: Occurs in chaparral and cismontane woodland. Elevation: 90-1500 meters. Blooms: Annual; April-July. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Hospital Canyon larkspur (*Delphinium californicum* ssp. *interius*) | CNPS 1B | Habitat: Occurs in chaparral openings and mesic cismontane woodlands. Elevation: 230-1095 meters. Blooms: April-June. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Recurved larkspur (*Delphinium recurvatum*) | CNPS 1B | Habitats: Occurs on alkaline soils in chenopod scrub, cismontane woodland, and valley and foothill grassland. Elevation: 3-750 meters. Blooms: Perennial herb; March-June. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Mt. Diablo buckwheat (*Eriogonum truncatum*) | CNPS 1B | Habitats: Occurs on sandy soils in chaparral, coastal scrub, and valley and foothill grassland. Elevation: 3-350 meters. Blooms: Annual; April-December. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Jepson's coyote-thistle (*Eryngium jepsonii*) | CNPS 1B | Habitats: Occurs in valley and foothill grassland and vernal pools. Elevation: 3-300 meters. Blooms: Perennial herb; April-August. | **Absent.** Although the site provides some potential habitat for this species, this perennial would have been observed if present and it has never been observed. There are no documented occurrences within three miles of the site. |
| Spiny-sepaled button-celery (*Eryngium spinosepalum*) | CNPS 1B | Habitats: Occurs on and valley and foothill grassland and vernal pools. Elevation: 80-975 meters. Blooms: Annual/Perennial herb; April-June. | **Absent.** No vernal pools occur on the site and wetlands and drainages of the site provide only marginal habitat for this species. This species was not detected during focused rare plant surveys conducted in May 2017 and is presumed absent. There are no documented occurrences within three miles of the site. |
| Diamond-petaled California poppy (*Eschscholzia rhombipetala*) | CNPS 1B | Habitats: Occurs on alkaline and clay soils in valley and foothill grassland. Elevation: 0-975 meters. Blooms: Annual; March-April. | **Absent.** The grasslands of the site provide marginal habitat for this species due to an absence of highly alkaline soils or clay soils. If present, senescent remains of this species would have been observed during the May 2017 focused rare plant surveys and no poppy species were observed. There are no documented occurrences within three miles of the site. |
| San Joaquin spearscale (*Extriplex joaquinana*) | CNPS 1B | Habitat: Occurs in chenopod scrub, meadows and seeps, playas, and valley and foothill grasslands on alkaline soils. Elevation: 1-835 meters. Blooms: April-October. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Stinkbells (*Fritillaria agrestis*) | CNPS 4 | Habitats: Occurs in chaparral, valley grassland, foothill woodland, wetland, and riparian habitats, and can be associated with serpentine soils. Elevation: 10-1555 meters. Blooms: Bulb; March-June. | **Absent.** Grasslands and seasonal wetlands of the site provide marginal habitat for this species; however, serpentine soils are absent from the site, and this species was not detected during focused rare plant surveys conducted in May 2017. There are no documented occurrences within three miles of the site. |
| Fragrant fritillary (*Fritillaria liliacea*) | CNPS 1B | Habitat: Occurs in coastal prairie, coastal scrub, and valley and foothill grasslands, often on serpentine soils Elevation: 3-410 meters. Blooms: February-April. | **Absent.** Grasslands of the study area are too heavily disturbed to provide habitat for this species and this species would have been observed if present on the development area during several surveys that occurred during its blooming season. There are no documented occurrences within three miles of the site. |
| Diablo helianthella (*Helianthella castanea*) | CNPS 1B | Habitats: Occurs in broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, riparian woodland, and valley and foothill grassland. Elevation: 60-1300 meters. Blooms: Perennial herb; March-June. | **Absent.** While the grasslands of the site provide marginal habitat for this species, this perennial plant would have been identified if present on the site during the 2012 through 2017 LOA surveys, and it was not detected during the focused rare plant survey conducted in May 2017. There are no documented occurrences within three miles of the site. |
| Brewer's western flax (*Hesperolinon breweri*) | CNPS 1B | Habitats: Occurs in chaparral, cismontane woodland, and valley and foothill grassland, usually on serpentine. Elevation: 30-900 meters. Blooms: Annual; May-July. | **Unlikely.** While grasslands of the site provide marginal habitat for this species, serpentine soils are absent from the site, and this species has never been detected during surveys of the site from 2012 through 2017, including a focused rare plant survey in May 2017. There are no documented occurrences within three miles of the site. |
| Legenere (*Legenere limosa*) | CNPS 1B | Habitat: Occurs in vernal pools. Elevation: 1-880 meters. Blooms: Annual; April–June. | **Absent.** Seasonal wetlands of the site may provide marginal habitat for this species, however, this species was not detected during focused rare plant surveys conducted in May 2017 and is presumed absent from the site. There are no documented occurrences within three miles of the site. |
| Hall's bush mallow (*Malacothamnus hallii*) | CNPS 1B | Habitat: Occurs in chaparral, coastal scrub and riparian woodland habitats, occasionally on serpentine. Elevation: 10-760 meters. Blooms: Evergreen shrub; May - September. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Woodland woolly-threads (*Monolopia gracilens*) | CNPS 1B | Habitat: Occurs on sandy or rocky soils, sometimes on serpentine, in grassy openings within cismontane woodlands and coniferous forest. Elevation: Above 800 meters. Blooms: Annual; February - May. | **Absent.** Habitat is absent from the site for this species. This species has not been observed in the project vicinity since 1935. There are no documented occurrences within three miles of the site. |
| Shining navarretia (*Navarretia nigelliformis* ssp. *radians*) | CNPS 1B | Habitat: Occurs in cismontane woodlands, valley and foothill grasslands, and vernal pools. Elevation: 76-1000 meters. Blooms: Annual; May-July. | **Absent.** Grasslands and seasonal wetlands of the site provide potential habitat for this species, however, this species was not detected during focused rare plant surveys in May 2017 and is presumed absent. There are no documented occurrences within three miles of the site. |
| Prostrate vernal pool navarretia (*Navarretia prostrata*) | CNPS 1B | Habitat: Occurs in mesic alkaline areas within coastal scrub, meadows and seeps, valley and foothill grasslands, and vernal pools. Elevation: 15-1210 meters. Blooms: Annual; April-July. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Mt. Diablo phacelia (*Phacelia phacelioides*) | CNPS 1B | Habitat: Occurs in rocky chaparral and cismontane woodland. Elevation: 500-1370 meters. Blooms: Annual; April-July. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Hairless popcorn-flower (*Plagiobothrys glaber*) | CNPS 1A | Habitat: Occurs in coastal saltmarshes and in alkaline meadows and seeps. Elevation: 15-180 meters. Blooms: Annual; March - May. | **Absent.** Marginal habitat for this species is present within the seasonal wetlands of the site; however, highly alkaline soils are absent. This species was not detected during focused rare plant surveys conducted in May 2017 and is presumed absent. There are only two reported occurrences of this species in the project vicinity; one in Livermore in 1942 and one in Dublin in 2002, although the latter occurrence is not confirmed. There are no documented occurrences within three miles of the site. |
| Oregon polemonium (*Polemonium carneum*) | CNPS 2 | Habitat: Occurs in coastal prairie, coastal scrub and lower montane coniferous forest. Elevation: 0-1830 meters. Blooms: Annual; March - May. | **Absent.** Habitat is absent from the site for this species. Species is only known from one occurrence in the project vicinity dating to 1932 near Castro Valley. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| California alkali grass (*Puccinellia simplex*) | CNPS 1B | Habitat: Occurs in alkaline, vernally mesic, sinks, flats, and lake margins within chenopod scrub, meadows and seeps, Valley and foothill grasslands, and vernal pools. Elevation:2-930 meters. Blooms: March-May. | **Unlikely.** Marginal habitat for this species is present within the seasonal wetlands of the site; however, highly alkaline soils are absent. There are no documented occurrences within three miles of the site. |
| Chaparral ragwort (*Senecio aphanactis*) | CNPS 2 | Habitat: Occurs in drying alkaline flats within coastal scrub and cis montane woodland habitats. Elevation: 50-575 meters. Blooms: Annual; January – April. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Mt. Diablo jewel-flower (*Streptanthus hispidus*) | CNPS 1B | Habitat: Occurs on rocky outcrops in chaparral and valley and foothill grasslands. Elevation: 365-1200 meters. Blooms: Annual; March-June. | **Absent.** Habitat is absent from the site for this species. There are no documented occurrences within three miles of the site. |
| Slender-leaved pondweed (*Stuckenia filiformis*) | CNPS 2 | Habitat: Occurs in shallow, clear waters within lakes and drainages. Elevation: 15-2310 meters. Blooms: Perennial. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |
| Saline clover (*Trifolium depauperatum* var. *hydrophilum*) | CNPS 1B | Habitat: Occurs in marshes and swamps, valley and foothill grasslands on mesic or alkaline soils, and vernal pools. Elevation: 0-300 meters. Blooms: Annual; April–June. | **Absent.** Marginal habitat for this species is present within the seasonal wetlands of the site; however, highly alkaline soils are absent. This species was not detected during focused surveys conducted in May 2017 and is presumed absent. There are no documented occurrences within three miles of the site. |
| Caper-fruited tropidocarpum (*Tropidocarpum capparideum*) | CNPS 1A | Habitat: Occurs on alkaline soils of valley and foothill grassland. Elevation: 1-455 meters. Blooms: Annual; March-April. | **Unlikely**. Grasslands of the site provide marginal habitat for this species due to a lack of highly alkaline soils. Species was once believed extinct but a population was discovered at Fort Hunter Ligget in Monterey County in 2000; however, the species was last documented in the project site area in 1957. There are no documented occurrences within three miles of the site. |
| Coastal triquetrella (*Triquetrella californica*) | CNPS 1B | Habitat: Moss that occurs on soil in coastal bluff scrub and coastal scrub. Elevation: 10-100 meters. | **Absent.** Suitable habitat for this species is absent from the study area. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**PLANTS (adapted from CDFW 2017 and CNPS 2017)**
***Other special status plants listed by the CDFG and CNPS***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Oval-leaved viburnum (*Viburnum ellipticum*) | CNPS 2 | Habitat: Occurs in chaparral, cismontane woodland and lower montane coniferous forest. Elevation: 215-1400 meters. Blooms: Deciduous shrub; May-June. | **Absent.** Habitat is absent on the site for this species. There are no documented occurrences within three miles of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Longhorn fairy shrimp (*Branchinecta longiantenna*) | FE | Occurs in ephemeral wetlands and vernal pools of California. | **Absent.** Although ephemeral wetlands are present on the site, vernal pools are absent. Longhorn fairy shrimp are presumed absent from the site as the site's wetlands do not hold surface water for very long, and when surface water is present, it is shallow and short-lived; additionally, the nearest recorded observation of LHFS is more than 3 miles from the site. |
| Vernal pool fairy shrimp (*Branchinecta lynchi*) | FT | Occurs in vernal pools of California. | **Absent.** Although ephemeral wetlands are present on the site, suitable habitat for vernal pool fairy shrimp in the form of vernal pools is absent. Vernal pool fairy shrimp are presumed absent from the site as the site's wetlands do not hold surface water for very long, and when surface water is present, it is shallow and short-lived; additionally, the nearest recorded observation of VPFS is more than 3 miles from the site. |
| Vernal pool tadpole shrimp (*Lepidurus packardi*) | FE | Occurs in vernal pools of California. Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water. | **Absent.** Although ephemeral wetlands are present on the site, suitable habitat for vernal pool tadpole shrimp in the form of vernal pools is absent. Vernal pool tadpole shrimp are presumed absent from the site as the site's wetlands do not hold surface water for very long, and when surface water is present, it is shallow and short-lived; additionally, the nearest recorded observation of VPTS is more than 3 miles from the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Callippe silverspot butterfly (*Speyeria callippe callippe*) | FE | Native grasslands. Host plant is *Viola pedunculata*. | **Absent.** A survey for the larval host plant, *Viola pedunculata* was conducted on all areas of the site proposed for development or slope stabilization and a minimum 75-foot buffer in May 2017 and none were observed. These areas of the site also do not support significant populations of nectar plants for this species, therefore, these areas do not provide habitat for this species and it is presumed absent. |
| California tiger salamander (*Ambystoma californiense*) | FT, CT | Breeds in vernal pools and stock ponds of central California; adults aestivate in grassland habitats adjacent to the breeding sites. | **Possible.** No suitable breeding habitat is on the site for the species; however, this species has been documented breeding in wetlands and ponds of the adjacent golf course property within their East Side Conservation Area, and there are five breeding ponds reported in the CNDDB that are within 1.2 miles from the site (one of which has been extirpated as a breeding site due to an earthen dam failure. Therefore, although no breeding habitat exists on the site, it is possible that CTS that breed in the vicinity estivate on the site. |
| California red-legged Frog (*Rana aurora draytonii*) | FT, CSC | Rivers, creeks and stock ponds of the Sierra foothills and coast range, preferring pools with overhanging vegetation. | **Unlikely**. Dr. Mark Jennings, a USFWS-approved specialist in amphibian survey and habitat evaluation, conducted a focused habitat assessment for CRLF in 2004 for Olberding and found the site to be unsuitable for CRLF. Dr Jennings conducted a follow up herpetological survey on the Spotorno site in January 2015 at LOA's request and confirmed that existing site conditions had not changed and that the site provides no breeding habitat for this species. The nearest documented occurrence in the CNDDB is approximately three miles southeast of the site and CRLF critical habitat is more than two and a half miles to the southeast of the site, however, Marcia Grefsrud/CDFW has indicated that CRLF have been detected in a pond on the adjacent golf course site. The upland grasslands of the project site appear to provide poor foraging and movement habitat for this species and it appears unlikely they would occur on the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Alameda whipsnake (*Masticophis lateralis euryxanthus*) | FT, CT | Ranges from the inner coast range in western and central Contra Costa and Alameda counties. Found in rock outcroppings and talus pilings, scrub communities, grasslands, oak, and oak/bay woodlands. | **Absent.** No suitable habitat occurs on site for the Alameda whipsnake. |
| White-tailed kite (*Elanus caeruleus*) | CP, CSC | Open grasslands and agricultural areas throughout central California. | **Present.** White-tailed kites have been observed on neighboring properties. Suitable nesting habitat does not occur on the site, however, foraging habitat is abundant on the site. |
| Swainson's hawk (nesting) (*Buteo swainsoni*) | CT | Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah. Requires adjacent suitable foraging areas such as grasslands or alfalfa fields supporting rodent populations. | **Unlikely.** Breeding habitat is absent and although potentially suitable foraging habitat is available throughout the project area; there are no documented occurrences of this species within a three-mile radius of the site. |
| Bald eagle (nesting & nonbreeding/wintering) (*Haliaeetus leucocephalus*) | CP | Breeding habitat is usually within 4 km of a water source in a tall tree or cliffs; roosting in large numbers in winter is common. | **Absent.** No suitable habitat occurs on site for the bald eagle. There are no documented occurrences of this species within a three-mile radius of the site. |
| American peregrine falcon (*Falco peregrinus anatum*) | FE, CE | Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large populations of other bird species. | **Unlikely.** No Peregrine Falcons were observed on site, and no suitable breeding habitat occurs on site, however, this species may be a rare migrant or transient on the site. There are no documented occurrences of this species within a three-mile radius of the site. |
| Least Bell's vireo (*Vireo bellii pusillus*) | FE, CE | Summer resident of cottonwood-willow forests, oak woodlands, shrubby thickets, and dry washes with willow thickets at the edges. Breeds in southern California. | **Absent.** No suitable habitat occurs on the site. There are no documented occurrences of this species within a three-mile radius of the site. |
| Tricolored blackbird (*Agelaius tricolor*) | CCE, CSC | Breeds near fresh water in dense emergent vegetation. | **Absent.** Suitable habitat is absent from the site for the tricolored blackbird; although they may move through the site when migrating. There are no documented occurrences of this species within a three-mile radius of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***Species Listed as Threatened or Endangered under the State and/or Federal Endangered Species Acts***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| San Joaquin kit fox (*Vulpes macrotis mutica*) | FE, CT | Frequents desert alkali scrub and annual grasslands and may forage in adjacent agricultural habitats. Utilizes enlarged (4 to 10 inches in diameter) ground squirrel burrows as denning habitat. | **Absent.** No San Joaquin kit fox burrows or sign have ever been observed on the site. Although two sightings within a 10-mile radius were once recorded in the CNDDB, supposedly observed in the period between 1972 and 1975, these sightings have now been removed from the CNDDB, likely because it is believed these sightings were other canid species and were misidentified as SJKF, as they are outside the currently accepted range for the species and no additional recent sightings have been reported in the vicinity since that time. Due to the lack of documented occurrences in the project vicinity and the project site being outside the currently accepted range for the species, kit foxes are presumed absent from the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***California Species of Special Concern and Protected Species***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Foothill yellow-legged frog (*Rana boylii*) | CSC | Found primarily in swiftly flowing creeks. | **Absent.** Suitable habitat is completely lacking on the site for this species. There are no documented occurrences of this species within a three-mile radius of the site. |
| Western spadefoot (*Spea hammondii*) | CSC | Primarily occurs in grasslands, but also occurs in valley and foothill hardwood woodlands. Requires vernal pools or other temporary wetlands for breeding. | **Absent.** Vernal pools required for breeding are absent from the study area, and wetlands onsite do not hold enough water for long enough to provide breeding habitat for this species. The nearest record is more than 3 miles from the site. There are no documented occurrences of this species within a three-mile radius of the site. |
| Western pond turtle (*Actinemys marmorata*) | CSC | Intermittent and permanent waterways including streams, marshes, rivers, ponds and lakes. Open slow-moving water of rivers and creeks of central California with rocks and logs for basking. | **Absent.** Suitable breeding habitat is absent from the site, and the nearest recorded observance of the WPT is approximately 2 miles to the south of the site. Additionally, the WPT was not observed on the neighboring property during special-status herp surveys in 2000 or 2002, or during other surveys conducted since the early 1990's. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***California Species of Special Concern and Protected Species***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| California horned lizard (*Phrynosoma coronatum frontale*) | CSC | Exposed gravelly-sandy substrate with scattered shrubs, clearings in riparian woodlands, dry uniform chamise chaparral, annual grasslands with seepweed or saltbrush. | **Absent.** There are no areas of suitable habitat large enough to support this species on site. There are no documented occurrences of this species within a three-mile radius of the site. |
| San Joaquin whipsnake (*Masticophis flagellum ruddocki*) | CSC | Open, dry habitats with little or no tree cover. Found in valley grasslands and saltbush scrub in the San Joaquin Valley. | **Absent.** The site is outside of the range for San Joaquin whipsnake. There are no documented occurrences of this species within a three-mile radius of the site. |
| Golden eagle (*Aquila chrysaetos*) | CSC | Typically frequents rolling foothills, mountain areas, sage-juniper flats and desert. | **Possible.** Nesting habitat is absent from the site, however, eagles have been documented nesting approximately 3.6 miles to the south east of the site in the foothills above San Antonio Reservoir, and therefore, it is possible that this species forages on the site. |
| Northern harrier (*Circus cyaneus*) | CSC | Frequents meadows, grasslands, open rangelands, freshwater emergent wetlands; uncommon in wooded habitats. | **Possible.** No northern harriers have been observed foraging on the site and there are no documented occurrences of this species within a three-mile radius of the site; however, potential nesting and foraging habitat occur on site. |
| Burrowing owl (*Athene cunicularia*) | CSC | Found in open, dry grasslands, deserts and ruderal areas. Requires suitable burrows. This species is often associated with California ground squirrels. | **Possible.** Suitable habitat (i.e., ground squirrel burrows) for the BUOW is currently absent from the site due to a lack of ground squirrel burrows. However, should ground squirrels colonize the site from adjacent properties, burrowing owls could also colonize the site prior to development. |
| Loggerhead shrike (nesting) (*Lanius ludovicianus*) | CSC | Frequents open habitats with sparse shrubs and trees, other suitable perches, bare ground, and low herbaceous cover. Nests in tall shrubs and dense trees. Forages in grasslands, marshes, and ruderal habitats. Can often be found in cropland. | **Possible.** Suitable nesting habitat for the loggerhead shrike is absent from the site, however, foraging habitat is present on the site. |
| Alameda song sparrow (*Melospiza melodia pusillula*) | CSC | Found in tidal salt marsh habitat with exposed ground for foraging with no more than 2-5 cm between bases of plants. Current range is generally only along the San Francisco Bay. | **Absent.** Habitat for this species is absent from the project area. There are no documented occurrences of this species within a three-mile radius of the site. |

**Table 2: Special status species that could occur in the project vicinity.**

**ANIMALS (adapted from CDFW 2017 and USFWS 2017)**
***California Species of Special Concern and Protected Species***

| Common and scientific names | Status | General habitat description | *Occurrence in the study area |
|---|---|---|---|
| Grasshopper sparrow (*Ammodramus savannarum*) | CSC | Occurs in California during spring and summer in open grasslands with scattered shrubs. | **Possible.** The site supports suitable nesting and foraging habitat for this species. There are no documented occurrences of this species within a three-mile radius of the site. |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | CSC | Primarily a cave-dwelling bat that may also roost in buildings. Occurs in a variety of habitats. | **Possible.** The site does not provide suitable roosting habitat for the Townsend's big-eared bat, but the species may forage over the site. There is a documented CNDDB occurrence of this species approximately ¼ mile north of the site. |
| Pallid bat (*Antrozous pallidus*) | CSC | Grasslands, chaparral, woodlands, and forests of California; most common in dry rocky open areas providing roosting opportunities. | **Possible.** The site does not provide suitable roosting habitat for the pallid bat, but the species may forage over the site. There are no documented occurrences of this species within a three-mile radius of the site. |
| San Francisco dusky-footed woodrat (*Neotoma fuscipes annectens*) | CSC | Found in hardwood forests, oak riparian and shrub habitats. | **Absent.** Riparian and woodland habitat is absent from the site. There are no documented occurrences of this species within a three-mile radius of the site. |
| American badger (*Taxidea taxus*) | CSC | Found in drier open stages of most shrub, forest and herbaceous habitats with friable soils, specifically grassland environments. Natal dens occur on slopes. | **Possible.** Although no burrows were observed on the site, it is possible this species may establish burrows on the site should they be present in the neighboring rangeland. There are no documented occurrences of this species within a three-mile radius of the site. |

***Explanation of Occurrence Designations and Status Codes**

Present: Species observed on the sites at time of field surveys or during recent past.
Likely: Species not observed on the site, but it may reasonably be expected to occur there on a regular basis.
Possible: Species not observed on the sites, but it could occur there from time to time.
Unlikely: Species not observed on the sites, and would not be expected to occur there except, perhaps, as a transient.
Absent: Species not observed on the sites, and precluded from occurring there because habitat requirements not met.

STATUS CODES

| | | | |
|---|---|---|---|
| FE | Federally Endangered | CE | California Endangered |
| FT | Federally Threatened | CT | California Threatened |
| FPE | Federally Endangered (Proposed) | CR | California Rare |
| FC | Federal Candidate | CP | California Protected |
| | | CSC | California Species of Special Concern |
| | | CCE | California Candidate Endangered |

| | | | |
|---|---|---|---|
| CNPS | California Rare Plant Rank | | |
| 1A | Plants Presumed Extinct in California | 3 | Plants about which we need more information – a review list |
| 1B | Plants Rare, Threatened, or Endangered in California and elsewhere | 4 | Plants of limited distribution – a watch list |
| 2 | Plants Rare, Threatened, or Endangered in California, but more common elsewhere | | |

Most of the special status plant and animal species listed in Table 2 are either presumed absent from or unlikely to occur on the site due to a lack of suitable habitat, or existence of very marginal habitat; while others would be considered to occur only rarely or occasionally on the site to forage. Sufficient information exists to evaluate the potential impacts the project may or may not have on these latter species. However, several species warrant a more in-depth discussion due to their potential to occur on the site and/or their legal status. These latter species include the Callippe silverspot butterfly, California tiger salamander (CTS), burrowing owl (BUOW), and American badger. These latter species are discussed in greater detail below.

**Callippe Silverspot Butterfly (*Speyeria callippe callippe*). Federal listing status: Endangered; State listing status: None.**

The Callippe Silverspot butterfly (*Speyeria callippe callippe*: Lepidoptera: Nymphalidae) was recognized as an endangered species in 1997 (U.S. Fish & Wildlife Service [USFWS] 1997). Although there are numerous subspecies within this widely distributed species, only the subspecies *S. callippe callippe* is protected under federal law.

Like many of the described subspecies of this silverspot species, *Speyeria callippe callippe* exhibits considerable phenotypic variation in its color, wing markings (maculations), and the amount of black scaling. Individuals of *S. callippe callippe* exhibit the following features:

a) dorsal forewings with thick, dark veins in males and prominent black maculations;

b) dorsal wings with pale yellow-orange ground color with an extensive black, sooty-appearing suffusion in the basal area of the forewings and hindwings;

c) ventral forewings with extensive reddish color in males;

d) ventral hindwings with a brown disc covered with yellow suffusion.

A closely related subspecies, *S. callippe comstocki*, differs from typical *S. callippe callippe* by exhibiting a reduced basal suffusion of black, sooty-appearing scales on the dorsal wings, mostly yellow color on the ventral forewings of males, and a mostly yellow disc. A few subspecies lack the silver spots that give this species its common name. Both subspecies of *Speyeria callippe*

*callippe* and *comstocki* occur in the San Francisco Bay area. The most recent five-year review for the species released by USFWS (2009) indicates that the two populations occurring in the project region have not yet been taxonomically verified as the rare subspecies, and as of the 2009 review, the USFWS only recognizes two populations of the rare subspecies: a San Bruno Mountain population and a Cordelia Hills population.

Due to the high degree of variation exhibited by individuals within a particular population, as well as geographic variation among populations, the limits of the variation have not been well defined and correlated with the subspecific taxonomic categories. As a result, it is often difficult to identify individual specimens and even populations to the subspecific level without examining a long series of specimens to determine which characteristics are prevalent in a particular population. Even then, some populations tend to exhibit more intermediate characteristics. Since wing colors and maculations may fade with age and scales are lost with age, this further complicates making taxonomic decisions at the subspecific level.

***Life History and Ecology.*** The Callippe silverspot (*Speyeria callippe callippe*) is endemic to the San Francisco Bay area. It occurs on hilly terrain within both grazed and ungrazed grassland habitat where its larval host plant, johnny jump-up (*Viola pedunculata)* grows. The host plant is typically associated with clay soils. Although the larval host plant is perennial, the above ground growth dies back annually so it can typically only be distinguished during the spring and early summer flowering season. Adult butterflies will visit the margins of oak woodlands and riparian areas in search of nectar, rock outcrops, as well as disturbed areas if favored nectar plants grow there.

The four primary habitat requirements of the Callippe silverspot are:

a) coastal grasslands supporting its larval food plants;

b) hilltops for mate location;

c) nectar plants in the grasslands or nearby oak woodlands, riparian areas, rock outcrops, or disturbed areas; and

d) shelter from on-shore coastal winds.

As the butterfly is known to be able to fly significant distances (up to a mile), these habitat requirements can be somewhat spread out and still support a silverspot population.

The silverspot butterflies produce just one generation each year. The four stages in a butterfly's life cycle include egg, larva (i.e., caterpillar), pupa, and adult. Larvae newly emerged from eggs immediately search out suitable hiding places such as under a rock where they enter a physiological resting stage, referred to as diapause, to survive the dry season and await the next rainy season when the larval food plant, Viola, sprouts new foliage and becomes edible, typically in late January to early February. Many of the young die during diapause. Surviving larvae will continue to periodically feed during the next four months, after which they will pupate and transform into adult butterflies.

The adult flight season typically begins in mid-May and ends in mid-July, although actual starting and ending times can vary by a few weeks from year-to-year and in different locations depending upon seasonal and microclimate weather variations. The average adult life span has been shown through a capture/recapture study to be about 5-7 days, but individuals have lived in a lab environment for as long as two weeks.

Because of the length of the flight season, adults may forage on nectar from the flowers of several different plant species as these plants flower at different times during the flight season. Preferred nectar species include native species such as bee balm (*Monardella* spp.) and California buckeye (*Aesculus californica*), but also include non-native (and often invasive) species such as *Silybum marianum*, *Carduus pycnocephalus*, and *Cirsium vulgare*. Because *Silybum* blooms earlier than the other species, it is utilized earliest in the flight season, while *Aesculus* is used during the middle, and *Monardella* is used towards the end of the season. While these latter species are the preferred nectar plants for the silverspot, the butterfly will utilize nectar from other plant species depending upon their availability at a particular location. Varied topography within the butterfly's habitat tends to extend the blooming season of individual nectar plant species and therefore increase the value of such habitat for the butterfly.

Areas where the larval and adult food plants grow do not always coincide with areas where mate location and other behaviors occur. For instance, adults tend to search for mates by congregating on hilltops ("hilltopping"). Adult males will also patrol breeding habitat in search of newly emerged females. Females, on the other hand, tend to spend more time in non-flight activities such as basking and perching.

Source: Arnold, Richard A. 2008.

***Occurrence on the Site***. A focused survey for the Callippe silverspot butterfly larval host plant, viola, was conducted on the proposed development areas, slope stabilization areas and a minimum 75-foot buffer in May 2017 and the larval host species was not detected. Additionally, these areas of the site do not support significant populations of nectar plants for this species. Therefore, we have concluded that habitat for the butterfly is absent from the site and the project will not impact habitat or individuals of this species.

**California Tiger Salamander (*Ambystoma californiense*). Federal Listing Status: Threatened; State Listing Status: Threatened.**

***Life History and Ecology.*** The California tiger salamander (CTS) is a large terrestrial salamander, with adults attaining a total length of over 8 inches (203 millimeters) [Stebbins 1951]. Dorsally, the background color appears to be jet black, and normally with an overlain pattern of white or yellow spots, or bars (Stebbins 1985; Petranka 1998). Adult California tiger salamanders breed from late November through February, following the onset of winter rains (Storer 1925; Barry and Shaffer 1994). Both males and females travel up to 1 mile (1.6 km) or more during nocturnal breeding migrations from subterranean refuge, or aestivation, sites (i.e., small mammal burrows) to egg deposition sites in long-lasting, rain-filled vernal pools (Twitty 1941; Loredo et al. 1961; Andersen 1968; Austin and Shaffer 1992).

Embryos of California tiger salamanders hatch in approximately 14-28 days after being laid and the resulting gilled, aquatic larvae [0.41-0.43 inches (10.5-11 mm) in length] require a minimum of about 10-12 weeks to complete development through metamorphosis (Storer 1925; Twitty 1941). Following metamorphosis (normally from early May through July), juveniles emigrate en masse at night into small mammal burrows or deep cracks in the soil, which they use as refugia during the hot summer and fall months (Shaffer et al. 1993; Loredo et al. 1996).

Anecdotal evidence indicates that salamanders have a high degree of site fidelity to their breeding ponds and also to the small mammal burrows they use for refugia (Shaffer et al. 1993). Sites used for reproduction are typically natural pools that fill with rainwater and artificial stock ponds; however, salamanders have also been observed to breed in springs, wells, artificial reservoirs, quarry ponds, man-made canals, and rarely, in the slack waters of oxbows in small- to medium-sized streams. Such sites may, or may not contain dense amounts of aquatic and streamside vegetation. The highest numbers of larvae appear to occur in aquatic habitats that are largely devoid of any vegetation and contain very turbid water. Salamanders may also turn up in certain man-made structures (e.g. wet basements, wells, swimming pools, underground pipes, and septic tank drains), sometimes many years after their local breeding site has been destroyed by urbanization (Storer 1925; Pickwell 1947).

Juvenile and adult salamanders typically use the burrows of California ground squirrels and pocket gophers as underground refugia (Storer 1925; Jennings and Hayes 1994; Jennings 1996; Loredo et a1. 1996) but may use a variety of burrows including cracks within the soil that may extend up to 15 feet (4.6 m) deep from the soil surface (Jennings, unpub. data). Juvenile and adult salamanders are especially common in situations where piles of concrete, rock, or other rubble are mixed with dirt and are located near breeding sites (Jennings, unpub. data). Findings from the limited research on the species suggest that 95% of a CTS population estivates within 2,000 feet of a breeding pond and that 99% of the breeding population estivates within 0.7 miles of a breeding pond; however, the USFWS considers suitable habitat within 1.3 miles of a known breeding pool to constitute potential upland habitat for the salamander.

***Occurrence on the Site***. There is no suitable breeding habitat for CTS on the site as seasonal wetlands of the site lack a suitable hydrologic regime for this species. According to Marcia Grefsrud/CDFW, however, ponds and wetlands on conservation areas to the east and south of the adjacent Callippe Golf Course property support CTS breeding in ponds, wetlands and at least one seep. The closest of these breeding sites is a pond occurring 0.31 miles east of the proposed development area of Spotorno Ranch. Therefore, it is possible that CTS estivate on the Spotorno project site.

**Burrowing Owl (*Athene cunicularia*). Federal Listing Status: None; State Listing Status: Species of Concern.**

The burrowing owl is considered a California species of special concern. This decision was based on the fact that the burrowing owl's population levels were decreasing due to habitat destruction, roadside nesting (vulnerability to human interference) and indirectly as a result of ground squirrel poisoning.

The burrowing owl is a small, long-legged, semi-fossarial bird that averages a height of 9.5 inches, has an average wingspan of 23 inches, and weighs an average of 5.25 ounces. Burrowing owls are unique, as they are the only owl that regularly lives and breeds in underground nests. In California, these birds typically occur in the Central and Imperial Valleys, primarily utilizing ground squirrel burrows (or the burrows of other animals, e.g., badgers, prairie dogs and kangaroo rats) found in grasslands, open shrub lands, deserts, and to a lesser extent, grazing and agricultural lands. Burrowing owls in this region are typically found in lower elevations, and have strong site fidelity. Pairs have been known to return to the same area year after year, and some pairs are known to utilize the same burrow as the previous year.

***Life History.*** Burrowing owls feed on various small mammals including deer mice, voles, and rats. They also prey on various invertebrates including crickets, beetles, grasshoppers, spiders, centipedes, scorpions and crayfish. Peak hunting periods occur around dusk and dawn.

The breeding season for the burrowing owl runs from February to August, with a peak between April and July. Clutch size varies from six to 12 eggs, with an average of seven to nine eggs. Females generally produce only one clutch per year. The female incubates the eggs for a month, while the male provides her food. The male continues to provide food during the brooding period. The young remain in their burrow for approximately two weeks after hatching, and become fully independent of their parents between eight to ten weeks of age. Burrowing owls are a fairly short-lived species, with an average life expectancy of 4.8 years. The oldest known wild burrowing owl was eight years and eight months old at the time of its death.

Burrowing owls are subject to predation by larger mammals (e.g., feral cats, bobcats, fox and coyotes). They are also susceptible to anthropogenic effects such as collisions with automobiles, and destruction or disruption of their nests, especially during the breeding season. The

burrowing owl may also be affected by ground squirrel eradication efforts. Burrowing owl numbers have been in decline over the past 30 to 40 years, in California. The decline in numbers is due mainly to habitat destruction by way of development and agricultural practices.

***Occurrence on the Site.*** Suitable habitat roosting and breeding habitat, in the form of ground squirrels and their burrows, currently appears to be absent from the proposed development area of the site and no occurrences of this species are documented in CNDDB within a three-mile radius of the site. However, should ground squirrels colonize the site from neighboring properties in the future, there is potential for the burrowing owl to roost and nest on the site in the future prior to site development.

**American Badger (*Taxidea taxus*). Federal Listing Status: None; State Listing Status: Species of Special Concern.**

The American badger is considered a California species of special concern. This decision was based on the fact that the badger's population levels were decreasing, mainly as a result of the conversion of open grassland habitats to agriculture and urban uses, trapping for fur, poisoning, and indirect poisoning as a result of consuming poisoned rodents. Rodents are the main food source for the badger.

The American badger measures 520 to 875 mm (20 to 34 inches) from head to tail, with the tail making up only about 1/5 of this length. Badgers weigh between 4 and 12 kg (approximately 9 to 26 pounds). The badger has a flattened body with short, stocky legs, and feet with strong claws that are up to 4-inches long. The fur on the back and flanks of the badger varies from brownish gray to a reddish color, with a buff colored underside. The face of the badger is distinct with several black patches on either side of its long snout. A white dorsal stripe extends back over the head from the nose. In northern populations, the dorsal stripe ends near the shoulders, while in southern populations it continues over the back to the rump. Male badgers are significantly larger than the females (Kurta, 1995; Long, 1999). Badgers are primarily solitary, coming together only for breeding purposes. Badgers are generally found throughout California's arid grasslands and scrublands with friable soils from sea level to 12,000 feet, except in the northern North Coast area (Grinnell et al, 1937). Badgers are primarily nocturnal and are rarely seen during the day.

***Life History***. The main food source for badgers is ground squirrels and pocket gophers; however, they also are known to feed on a variety of other small- to medium-sized mammals including deer mice, voles, and rats; on plant roots; on reptiles and their eggs; and on birds and their eggs. Badgers are opportunistic foragers and their food sources shift seasonally with availability.

Badgers generally breed in late summer or early fall, experiencing a delayed implantation. Although the badger female is technically pregnant for seven months, actual gestation takes 6 weeks. Most cubs (pups or kits) are born in March or April and litter size ranges from 1 to 5 with an average of 3 (Long 1973). Females can breed as young as 4 to 6 months of age; however, their first litter usually occurs after one year of age. Males do not usually breed until after their second year. Badger cubs are born blind, furred and helpless (ibid). Their eyes open between 4 and 6 weeks of age, and they are nursed for approximately 2 months. After 2 months of age the mother starts supplementing their diet with solid food, usually small rodents. Most young disperse shortly after weaning, while some remain in their natal area until the next breeding season. They may roam up to 100 km (62 miles) to find their own home range. The average life of badgers in the wild is between 8 and 12 years.

The home range size for badgers varies by sex, season and prey base, with males having larger home ranges than females. One study indicated males had an average home range of 2,100 acres, while one radio collared female had a home range of 1,790 acres in summer, 131 acres in fall, and only 5 acres during the winter (Sargeant and Warner 1972). Another study indicated a home range size between 667 and 1,550 acres for both sexes (Lindzey 1978).

Badgers often hunt for prey by digging into fossorial mammal burrows. Coyotes have been known to follow badgers to take advantage of an easy meal as rodents are flushed from their burrows. Badgers may enlarge hunting burrows for sleeping and protection from weather. During the summer months, they dig new resting burrows nearly every day; these burrows are usually only a few feet deep. Their natal dens are more permanent and may be as much as 30 feet long and 10 feet deep (Banfield 1974).

Badgers are ferocious animals and have few natural predators, though they can be preyed upon by bear (*Ursus americanus*), bobcat, and cougar. As discussed above, the main threat to badgers comes from anthropogenic effects.

***Occurrence on the site***. No potential badger dens have been observed on the proposed development area, and the site currently appears to lack a suitable prey base for this species due to a lack of ground squirrels and other small mammal prey. Additionally, there have been no documented occurrences in the CNDDB of badgers within a three-mile radius. However, it is possible that badgers occur on the site from time to time to forage or during movements between habitats to the north, east and south of the site. It is also possible that should ground squirrels from surrounding areas colonize the site in the future, badgers may also forage more frequently on the development area and establish dens there.

### 2.4 JURISDICTIONAL WATERS

Jurisdictional waters include rivers, creeks, and drainages that have a defined bed and bank and which, at the very least, carry ephemeral flows. Jurisdictional waters also include lakes, ponds, reservoirs, and wetlands. Such waters may be subject to the regulatory authority of the U.S. Army Corps of Engineers (USACE), the California Department of Fish and Wildlife (CDFW), and the California Regional Water Quality Control Board (RWQCB). See Section 3.2.4 of this report for additional information.

Two wetland delineations have been conducted on the site, one by Olberding in 2008 which was subsequently verified by USACE, and one by LOA in January and April 2015. The second delineation was conducted due to the expiration of the Jurisdictional Determination (JD) for the prior delineation and because it appeared that the condition of wetlands on the site had changed since the 2008 delineation. A site verification visit was conducted with Keith Hess/USACE on June 30, 2016, however, although a new JD is forthcoming, at the time of the preparation of this report, it had not yet been issued by USACE.

# LEGEND

**Areas meeting the technical criteria of Jurisdictional Waters or Waters of the U.S.**

- Isolated Seasonal Wetlands (36,983 SF, 0.85 Acres)
- Seasonal Wetland (19,644 SF, 0.45 Acres)
- Seasonal Drainage (205 SF, 205 LF)
- Isolated Drainage (1,423 SF, 691 LF)

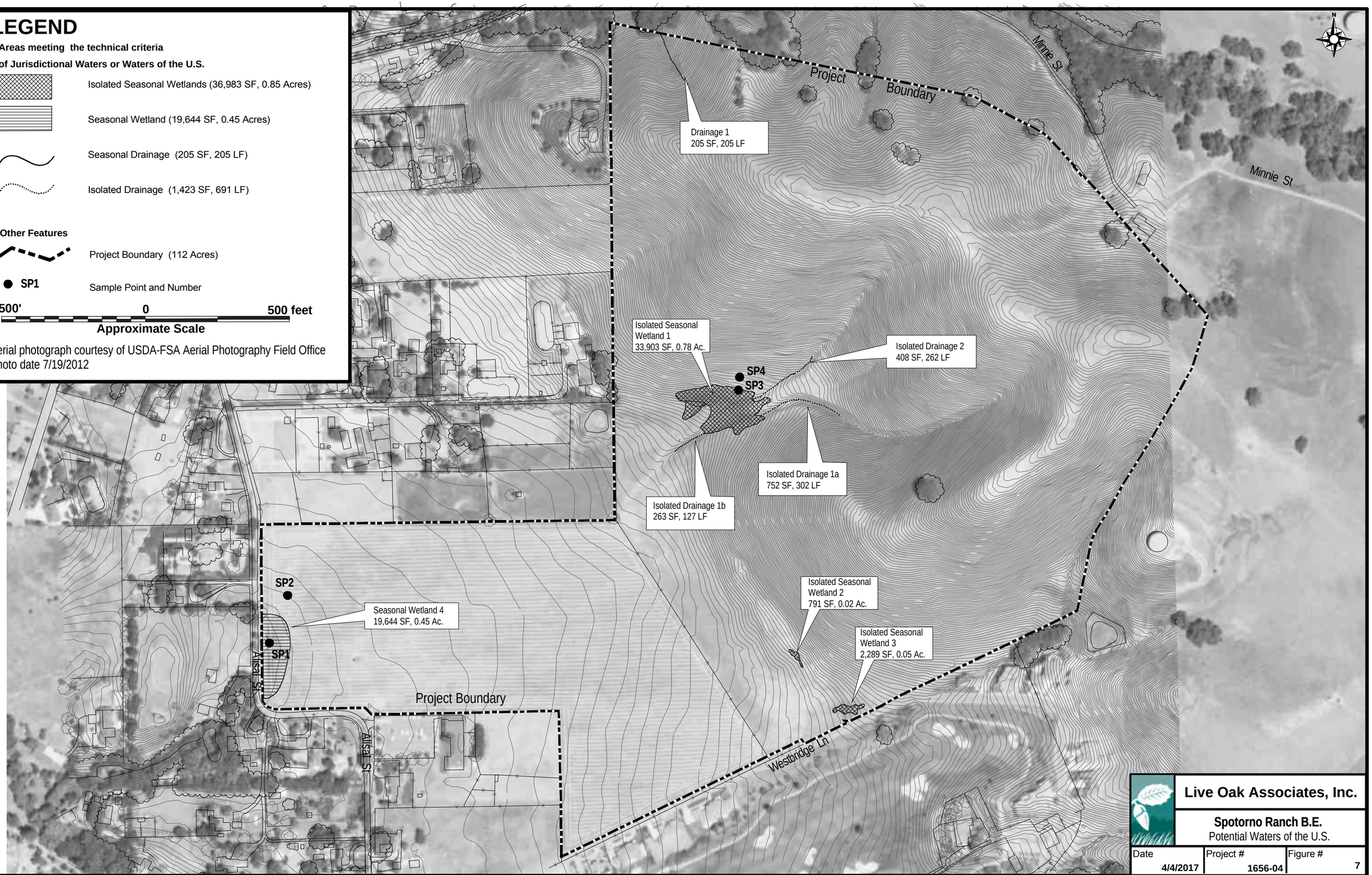
**Other Features**

- Project Boundary (112 Acres)
- SP1 — Sample Point and Number

500' 0 500 feet

**Approximate Scale**

Aerial photograph courtesy of USDA-FSA Aerial Photography Field Office
Photo date 7/19/2012

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**Spotorno Ranch B.E.**
Potential Waters of the U.S.

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The LOA delineation determined that there are four seasonal wetlands and four intermittent drainage channels on the site (Figure 7). Only Seasonal Wetland 4 in the western portion of the site near Alisal Street (0.45 acres) and Drainage 1 (205 linear feet) in the northern portion of the site which is a tributary to Sycamore Creek appear to be hydrologically connected to other waters of the U.S. and therefore would be considered jurisdictional by USACE. The other hydrologic features appear to be isolated and therefore not considered jurisdictional by USACE, however, all the wetlands and channels of the site, whether they are isolated or not, would be considered jurisdictional by the RWQCB. The on-site channels would also be considered jurisdictional by CDFW to the top of the bank.

Most of the drainages and wetlands of the site occur in areas proposed as open space and will not be impacted by the project; however, Isolated Wetland 2 (0.02 acre) occurs in an area proposed for bank stabilization and we understand that Seasonal Wetland 4 will likely be temporarily impacted as a result of trenching for a pipeline to convey stormwater from a proposed onsite detention basin and that possibly a small area of the wetland could also be permanently impacted by construction of an emergency vehicle access road, as the designs and locations of these latter project elements were not yet clearly defined at the time of preparation of this report. We would estimate that trenching for the stormwater pipeline and the EVA would result in less than 0.02 acre of temporary disturbance and 0.1 acre of permanent disturbance, respectively.

# 3.0 IMPACTS AND MITIGATIONS

## 3.1 SIGNIFICANCE CRITERIA

General plans, area plans, and specific projects are subject to the provisions of the California Environmental Quality Act (CEQA). The purpose of CEQA is to assess the impacts of proposed projects on the environment before they are constructed. For example, site development may require the removal of some or all of its existing vegetation. Animals associated with this vegetation could be destroyed or displaced. Animals adapted to humans, roads, buildings, pets, etc. could potentially replace those species formerly occurring on a site. Plants and animals that are state and/or federally listed as threatened or endangered may be destroyed or displaced. Sensitive habitats such as wetlands and riparian woodlands may be altered or destroyed. These impacts may be considered significant or not. According to *Guide to the California Environmental Quality Act*, "Significant effect on the environment" is interpreted as a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic interest. Specific project impacts to biological resources may be considered "significant" if they will:

- have a substantial adverse effect, the 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 Wildlife or U.S. Fish and Wildlife Service;

- have a substantial 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 Wildlife or U.S. Fish and Wildlife Service;

- 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 other means;

- interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery site;

- reduce substantially the habitat of a fish or wildlife species, including causing a fish or wildlife population to drop below self-sustaining levels or threaten to eliminate an animal community;

- conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;

- conflict with the provisions of an adopted Habitat Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Furthermore, CEQA Guidelines Section 15065 states that a project may trigger the requirement to make a "mandatory findings of significance" if "the project has the potential to subsequently 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 eliminate a plant or animal community, reduce the number or restrict the range on an endangered, rare or threatened species, or eliminate important examples of the major periods of California history or prehistory."

## 3.2 RELEVANT GOALS, POLICIES, AND LAWS

### 3.2.1 Threatened and Endangered Species

State and federal "endangered species" legislation has provided the California Department of Fish and Wildlife (CDFW) and the U.S. Fish and Wildlife Service (USFWS) with a mechanism for conserving and protecting plant and animal species of limited distribution and/or low or declining populations. Species listed as threatened or endangered under provisions of the state and federal endangered species acts, candidate species for such listing, state species of special concern, and some plants listed as endangered by the California Native Plant Society are collectively referred to as "species of special status." Permits may be required from both the CDFW and USFWS if activities associated with a proposed project will result in the "take" of a

listed species. "Take" is defined by the state of California as "to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture or kill" (California Fish and Wildlife Code, Section 86). "Take" is more broadly defined by the federal Endangered Species Act to include "harm" (16 USC, Section 1532(19), 50 CFR, Section 17.3). Furthermore, the CDFW and the USFWS are responding agencies under the California Environmental Quality Act (CEQA). Both agencies review CEQA documents in order to determine the adequacy of their treatment of endangered species issues and to make project-specific recommendations for their conservation.

### 3.2.2 Migratory Birds

State and federal laws also protect most birds. The Federal Migratory Bird Treaty Act (16 U.S.C., scc. 703, Supp. I, 1989) prohibits killing, possessing, or trading in migratory birds, except in accordance with regulations prescribed by the Secretary of the Interior. This act encompasses whole birds, parts of birds, and bird nests and eggs.

### 3.2.3 Birds of Prey

Birds of prey are also protected in California under provisions of the State Fish and Wildlife Code, Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Construction disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment. Disturbance that causes nest abandonment and/or loss of reproductive effort is considered "taking" by the CDFW.

### 3.2.4 The Bald and Golden Eagle Protection Act

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this Act. Take of bald and golden eagles is defined as follows: "disturb means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or

sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior'' (72 FR 31132; 50 CFR 22.3).

### 3.2.5 Bats

Section 2000 and 4150 of the California Fish and Wildlife Code states that it unlawful to take or possess a number of species, including bats, without a license or permit as required by Section 3007. Additionally, Title 14 of the California Code of Regulations states it is unlawful to harass, herd, or drive a number of species, including bats. To harass is defined as "an intentional act which disrupts an animal's normal behavior patterns, which includes, but is not limited to, breeding, feeding or sheltering".

### 3.2.6 Wetlands and Other Jurisdictional Waters

Natural drainage channels and adjacent wetlands may be considered "Waters of the United States" (hereafter referred to as "jurisdictional waters") subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE). The extent of jurisdiction has been defined in the Code of Federal Regulations but has also been subject to interpretation of the federal courts. Jurisdictional waters generally include:

- All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- All interstate waters including interstate wetlands:
- All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce;
- All impoundments of waters otherwise defined as waters of the United States under the definition;
- Tributaries of waters identified in paragraphs (a)(1)-(4) (i.e. the bulleted items above).

As recently determined by the United States Supreme Court in *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* (the SWANCC decision), channels and wetlands isolated from other jurisdictional waters cannot be considered jurisdictional on the basis of their use, hypothetical or observed, by migratory birds. However, the U.S Supreme Court decisions *Rapanos v. United States* and *Carabell v. U.S. Army Corps of Engineers* impose a "significant nexus" test for federal jurisdiction over wetlands. In June 2007, the USACE and Environmental Protection Agency (EPA) established guidelines for applying the significant nexus standard. This standard includes 1) a case-by-case analysis of the flow characteristics and functions of the tributary or wetland to determine if they significantly affect the chemical, physical, and biological integrity of downstream navigable waters and 2) consideration of hydrologic and ecologic factors (EPA and USACE 2007).

The USACE regulates the filling or grading of such waters under the authority of Section 404 of the Clean Water Act. The extent of jurisdiction within drainage channels is defined by “ordinary high water marks” on opposing channel banks. Wetlands are habitats with soils that are intermittently or permanently saturated, or inundated. The resulting anaerobic conditions select for plant species known as hydrophytes that show a high degree of fidelity to such soils. Wetlands are identified by the presence of hydrophytic vegetation, hydric soils (soils saturated intermittently or permanently saturated by water), and wetland hydrology according to methodologies outlined in the 1987 Corps of Engineers Wetlands Delineation Manual (USACE 1987).

All activities that involve the discharge of fill into jurisdictional waters are subject to the permit requirements of the USACE (Wetland Training Institute, Inc. 1991). Such permits are typically issued on the condition that the applicant agrees to provide mitigation that result in no net loss of wetland functions or values. No permit can be issued until the Regional Water Quality Control Board (RWQCB) issues a certification (or waiver of such certification) that the proposed activity will meet state water quality standards. The filling of isolated wetlands, over which the USACE has disclaimed jurisdiction under the SWANCC decision, is regulated by the RWQCB. It is unlawful to fill isolated wetlands without filing a Notice of Intent with the RWQCB. The RWQCB is also responsible for enforcing National Pollution Discharge Elimination System

(NPDES) permits, including the General Construction Activity Storm Water Permit. All projects requiring federal money must also comply with Executive Order 11990 (Protection of Wetlands).

The California Department of Fish and Wildlife (CDFW) has jurisdiction over the bed and bank of natural drainages according to provisions of Section 1601 and 1602 of the California Fish and Game Code (2003). Activities that would disturb these drainages are regulated by the CDFW via a Streambed Alteration Agreement. Such an agreement typically stipulates that certain measures will be implemented which protect the habitat values of the drainage in question.

### 3.2.7 Local Ordinances, Policies, and Habitat Conservation Plans

***East Alameda County Conservation Strategy***

The East Alameda County Conservation Strategy of 2010 provides "context and guidance to project applicants, local jurisdictions with permit authority, and resource agencies in determining the potential impacts of a project and the level and type of mitigation necessary to offset those impacts". This document suggests a standard mitigation ratio of 3:1, which may vary depending on the type of habitat lost and the type of Conservation Zone the project is within.

***City of Pleasanton General Plan (2009)***

The City of Pleasanton has a General Plan that was adopted in 2009. Among other policies, this plan includes policies on heritage tree preservation and grading cessation when historic artifacts are found. All General Plan policies should be followed.

***City of Pleasanton Municipal Code – Tree Preservation***

Heritage trees are illegal to remove without the appropriate permit. Chapter 17.16 of the City's municipal code defines a Heritage tree as:

1. "Any single-trunked tree with a circumference of 55 inches or more measured four and one-half feet above ground level;
2. Any multi-trunked tree of which the two largest trunks have a circumference of 55 inches or more measured four and one-half feet above ground level;
3. Any tree 35 feet or more in height;
4. Any tree of particular historical significance specifically designated by official action;

5. A stand of trees, the nature of which makes each dependent upon the other for survival or the area's natural beauty."

However, the municipal code also states that the definition of a Heritage Tree "…shall not apply to fruit or nut trees when part of an orchard, the produce of which is used for commercial purposes (Ord. 1737 § 1, 1998)". Removal of Heritage Trees requires a permit from the City.

***Creek setback***

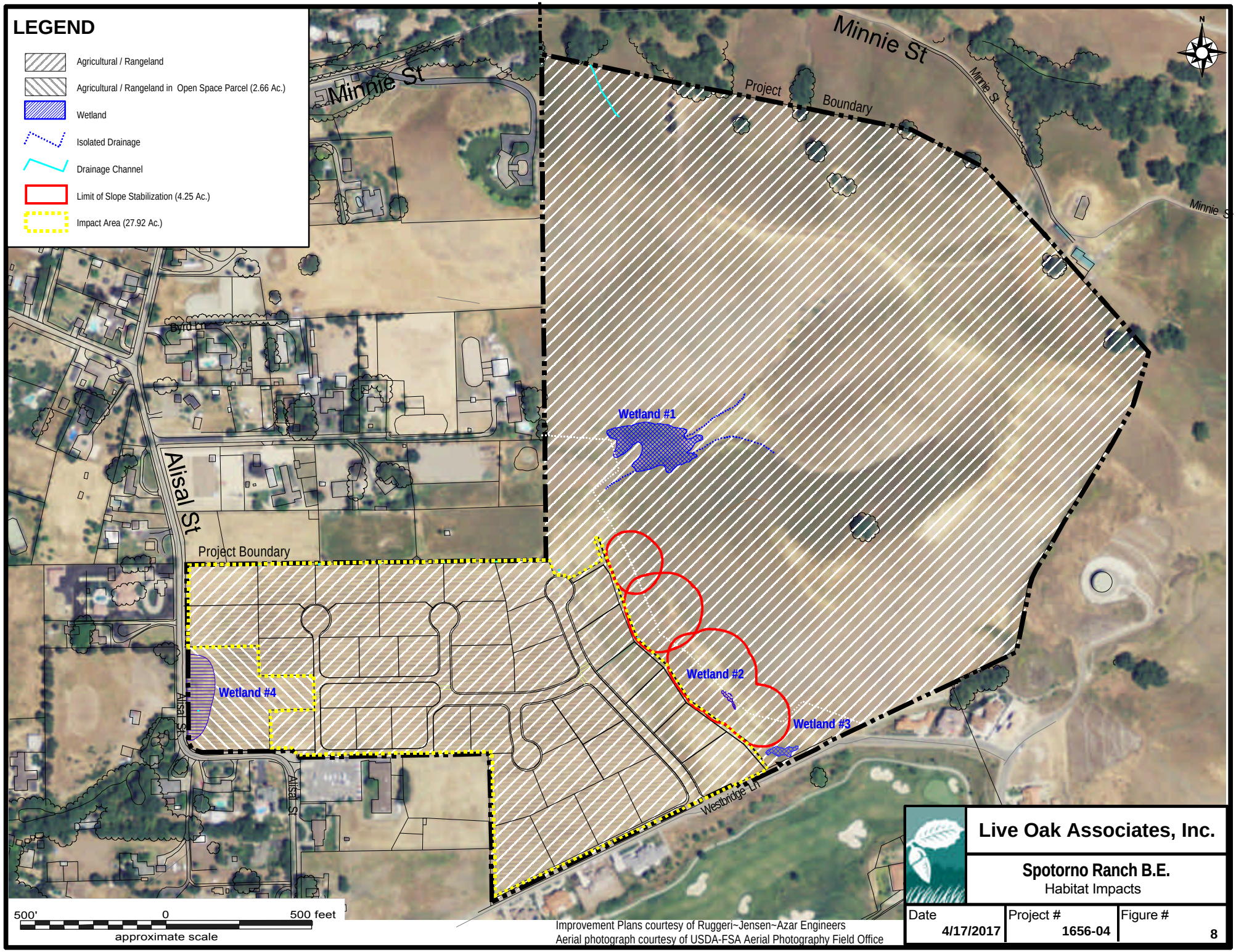
The City of Pleasanton determines appropriate creek setbacks on a case by case basis. Required setbacks from a creek will be established by the City of Pleasanton and will be guided by the geological stability and habitat significance of a creek to the City.

***HCPs/NCCPs***

No known habitat conservation plans are in effect for this property.

## 3.3 ENVIRONMENTAL IMPACT/MITIGATION

Figure 8 depicts the Spotorno Ranch site plan overlaid on habitats of the site. The project will result in permanent impacts to approximately 28 to 30 acres of primarily grasslands used for hay production as a result of the development of the homes and associated infrastructure. The additional slope stabilization will result in impacts to approximately 4.25 acres, including 0.02 acres of seasonal wetlands. Although no specifics plans were available at the time of the preparation of this document, and details are not provided on Figure 8, there will be some additional impacts as a result of the project occurring in the common parcel along Alisal Street. These project elements will include trenching for the installation of a pipeline to convey stormwater from a proposed detention pond to an existing culvert near Alisal Street as well as construction of an emergency vehicle access road (EVA). Alignments for these latter two elements are still being determined, but potentially these project elements could impact the large seasonal wetland (Wetland 4) occurring within the common parcel. Potential impacts are discussed in greater detail below.




Improvement Plans courtesy of Ruggeri~Jensen~Azar Engineers
Aerial photograph courtesy of USDA-FSA Aerial Photography Field Office

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Habitat Impacts

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### 3.3.1 Conflict with an Adopted Habitat Conservation Plan

**Potential Impact.** There are no adopted Habitat Conservation Plans that cover the site (however, see Section 3.3.14 regarding the East Alameda County Conservation Strategy).

**Mitigation.** None required.

### 3.3.2 Potential Impacts to California Tiger Salamander Habitat and Individuals

**Potential Impact.** Although breeding habitat is absent from the site, there are five breeding ponds reported in the CNDDB that are within 1.2 miles from the site. One of these latter ponds has been extirpated as a breeding site due to an earthen dam failure. Breeding ponds exist to the southeast and north of the site, and the Olberding 2008 report includes two additional sightings: a 2006 sighting of two adults in a seep in the northern portion of the East Side Conservation Area within the Callippe Golf Course and a 1999 sighting in a neighbor's pond which is located to the north of the present site boundaries. Additionally, Marcia Grefsrud/CDFW has indicated that there have been more recent observances of breeding CTS in a pond, wetland and seep located within the East Side Conservation Area, with the closest observance being within 0.31 miles of the proposed development and slope stabilization areas of the Spotorno Ranch development site.

Dr. Mark Jennings completed surveys of the site in 2012 and 2015 to assess the suitability of the site to support habitat for California tiger salamanders. He examined the project site, as well as potential aquatic habitats in the surrounding vicinity (where accessible). He determined that none of the seasonal wetlands on the site supported appropriate hydrology to provide breeding habitat for CTS, and he also observed that a former aquatic pond adjacent to the site (on private property) no longer exists; and that former California tiger salamander breeding habitat on adjacent Lund Ranch had been eliminated for at least 8 years as of his 2015 survey.

Additionally, according to the owner Al Spotorno, he and family members have conducted California ground squirrel (*Spermophilus beecheyi*) control for decades to keep livestock from potentially stepping in burrows and injuring themselves; and the fields on his property are disked to grow hay and legumes, upon which livestock are turned out to feed, on an annual basis. As a

result, Dr. Jennings observed no ground squirrel burrows on the Spotorno project area. However, it was observed that the neighboring property to the north of the site does continue to have ground squirrels and ground squirrel burrows present. Dr. Jennings also noted the presence of some clusters of Botta pocket gopher (*Thomomys bottae*) burrows, as well as large cracks in the clay soils of the site that could provide some refuge for estivating CTS, should they occur on the site. Therefore, although no breeding habitat exists on the Spotorno site, it is possible that CTS estivate on the site.

The project would result in development of approximately 28 to 30 acres of areas that provide the least suitable estivation habitat for CTS due to ongoing hay production and ground squirrel abatement practices, while preserving via a deed restriction, conservation easement, or similar conservation mechanism, approximately 81 acres of grasslands that are used as rangeland. These latter areas are significantly less disturbed, and are immediately adjacent to properties known to support breeding CTS. The preservation of approximately 81 acres of open space with a deed restriction, conservation easement, or similar conservation mechanism, which provides more suitable CTS estivation habitat will compensate for the loss of approximately 28 to 30 acres of marginal estivation habitat, therefore the project as currently proposed will result in a less-than-significant impact on upland habitat for CTS.

Although the development area is considered marginal estivation habitat, should CTS estivate on the development area during project construction, individual CTS could be harmed or killed by project construction activities and this would be considered a significant impact. Mitigations to lessen impacts to individual CTS to a less-than-significant level are provided below.

**Mitigation.** Typically, mitigations to reduce impacts to CTS individuals would take the form of avoidance, minimization and compensatory measures.

***Avoidance and Minimization Measures***. To avoid and minimize impacts to CTS individuals, the following measures will be followed:

- Prior to the start of construction, a qualified biologist will train all construction personnel regarding habitat sensitivity, identification of special status species potentially occurring on the site, and required practices.

- Pre-construction surveys will be conducted to ensure that CTS are absent from the construction area. If CTS are present, they should be relocated by a qualified biologist.
- The construction zone should be cleared, and silt fencing should be erected and maintained around construction zones to prevent CTS from moving into these areas.
- A biological monitor will be present onsite during particular times of construction to ensure no CTS are harmed, injured, or killed during project buildout.
- To minimize harm or mortality to individual CTS during migration movements, a maximum speed limit of 10 mph for vehicle traffic on the project site during both construction and operation phases will be enforced.

Additional avoidance and minimization measures to ensure that no individual CTS are harmed or killed by the project are included in Appendix A. CTS is considered a focal species of the EACCS and general and species-specific avoidance and minimization measures included in the EACCS Biological Opinion which also will be implemented are included in Appendix B.

*Compensation.* The project description already includes the preservation of approximately 81 acres of open space that will be preserved with a deed restriction, conservation easement, or similar conservation mechanism which provides better quality potential estivation habitat for CTS than the 28 to 30 acres of marginal estivation habitat that will be impact. These preserved lands along with a Habitat Management Plan, would result in a less than significant impact for loss of CTS upland habitat. A Habitat Management Plan will be developed for the preserved land by a qualified biologist to benefit CTS and other grassland species that may occur there such as the burrowing owl and American badger. Therefore, we believe the project as currently proposed would result in a less than significant impact on upland habitat for CTS.

*Regulatory issues*. In addition to implementing avoidance, minimization and compensation measures for CTS under CEQA, as described above, the applicant would need to comply with provisions of the federal and state Endangered Species Acts and may need to seek take authorization from both the USFWS and CDFW for project-related losses as required by law. To obtain a federal take permit, consultation with the U.S. Fish and Wildlife Service may need to be initiated either through a federal nexus (i.e., Section 7 consultation through the USACE) or through the HCP process (i.e., Section 10 consultation).

### 3.3.3 Potential Impacts to California Red-Legged Frog Habitat and Individuals

**Potential Impact.** The project site provides no breeding habitat for this species, and although CRLF have been detected in ponds on the adjacent golf course property, it is considered unlikely that this species would occur in the upland habitats of the project site to forage or move between other suitable habitats. Therefore, the project is expected to have a less-than-significant impact on this species.

**Mitigation.** None required.

### 3.3.4 Potential Impacts to Burrowing Owls

**Impact.** Currently, the development area and slope stabilization areas provide no habitat for BUOW due to a lack of ground squirrels and ground squirrel burrows. However, ground squirrels have been observed to occur on adjacent properties, and should they colonize the site in the future prior to project development, potentially BUOW could also colonize the site. Should BUOW nest or roost on the site in the future, project activities could result in a loss of habitat for this species and in impacts to individual owls. Construction activities that adversely affect the nesting success of BUOW or that result in mortality of individual owls that are nesting or roosting on the site would constitute a violation of state and federal laws and would be considered a significant impact under CEQA.

**Mitigation Measure.** Implementation of the following measures would reduce impacts to BUOW habitat and to individual BUOW to a less-than-significant level. These measures would also be consistent with the goals and objectives of the EACCS. BUOW is considered a focal species of the EACCS and general and species-specific avoidance and minimization measures included in the EACCS Biological Opinion which also will be implemented are included in Appendix B. The project proposes the preservation of approximately 81 acres of grasslands as open space to be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar conservation mechanism, with a habitat management plan and this will compensate for the permanent loss of approximately 28 to 30 acres of BUOW foraging and potential future BUOW roosting and nesting habitat.

To avoid impacts to active burrowing owl nests, a qualified biologist should conduct pre-construction surveys for burrowing owls within the construction footprint and within 250 ft. of the footprint no more than 30 days prior to the onset of ground disturbance. These surveys should be conducted in a manner consistent with accepted burrowing owl survey protocols. If pre-construction surveys determine that burrowing owls occupy the site during the non-breeding season (September 1 through January 31), then a passive relocation effort (e.g., blocking burrows with one-way doors and leaving them in place for a minimum of three days) may be necessary to ensure that the owls are not harmed or injured during construction. Once it has been determined that owls have vacated the site, the burrows can be collapsed, and ground disturbance can proceed. If burrowing owls are detected within the construction footprint or immediately adjacent lands (i.e., within 250 feet of the footprint) during the breeding season (February 1 through August 31), a construction-free buffer of 250 ft. should be established around all active owl nests. The buffer area should be enclosed with temporary fencing, and construction equipment and workers should not enter the enclosed setback areas. Buffers should remain in place for the duration of the breeding season or until it has been confirmed by a qualified biologist that all chicks have fledged and are independent of their parents. After the breeding season, passive relocation of any remaining owls may take place as described above.

### 3.3.5 Potential Impacts to Callippe Silverspot Butterflies

**Potential Impact.** A focused survey for the Callippe silverspot butterfly larval host plant, viola, was conducted on the proposed development area, slope stabilization areas and a minimum 75-foot buffer and none were detected. Further, these areas of the site do not support significant populations of nectar plants for the butterfly. Therefore, habitat for this species is considered absent from all areas that are proposed to be impacted by the project and the project is expected to have no impact on this species or its habitat.

**Mitigation**. None required.

### 3.3.6 Disturbance to Nesting Raptors and Nesting Migratory Birds

**Potential Impact.** Although no trees occur within the areas that will be impacted by the project or by slope stabilization activities, and therefore, the project would not be expected to result in impacts to tree-nesting raptors or other tree-nesting birds, the grassland habitats of the site

provide potential nesting habitat for two special status bird species (northern harrier and grasshopper sparrow) and potentially for non-special status migratory birds that nest on the ground. Project activities including noise, ground disturbance and vegetation removal that commence during the nesting season (February 1 through August 31) could result in nest abandonment by adult birds and result in mortality to their unfledged young. This would constitute a violation of state and federal law and would be considered a significant impact under CEQA.

**Mitigation Measure.** Implementation of the following mitigation measures would reduce impacts to nesting birds to a less-than-significant level.

To the maximum extent practicable, vegetation planned for removal should be removed during the non-breeding season, i.e. removed during the period from September 1st through January 31st. If it is not possible to avoid vegetation removal or other disturbances during the breeding season (February 1 through August 31), then a qualified biologist will conduct a pre-construction survey for ground-nesting raptors and migratory birds in all potential nesting habitat within the development and bank stabilization impact areas and within 250 ft. of these areas. This survey should be conducted no more than 14 days prior to the initiation of demolition/construction activities during the early part of the breeding season (February through April) and no more than 30 days prior to the initiation of these activities during the latter part of the breeding season (May through August). If nesting raptors or migratory birds are detected on the site during the survey, a suitable construction-free buffer will be established around all active nests. The precise dimension of the buffer (up to 250 ft.) would be determined by the qualified biologist at that time and may vary depending on location and species. Buffers will remain in place for the duration of the breeding season or until it has been confirmed by the qualified biologist that all chicks have fledged and are independent of their parents. Pre-construction surveys during the non-breeding season are not necessary (with the exception of pre-constructions surveys for burrowing owls, see *Impact 3.3.4*, above), as adult birds would be expected to abandon their roosts during project implementation activities and therefore, would not be expected to be harmed or killed.

Implementation of the above measures would reduce impacts to ground-nesting raptors and other ground-nesting birds to a less-than-significant level.

### 3.3.7 Potential Impacts to American Badgers

**Impact.** Areas that would be impacted by the project currently provide very marginal habitat for badgers due to the lack of a significant small mammal prey base (as a result of longterm abatement of ground squirrels and other small mammals on the site) and no badgers or potential badger dens have been observed in these areas. However, should conditions change on the site in the future prior to project implementation, badgers potentially could occur on the site and establish dens. The project already includes the preservation of approximately 81 acres of open space with a habitat management plan that provides potential foraging, denning and breeding habitat for this species which would more than compensate for a loss of approximately 28 to 30 acres of such potential habitat and result in a less than significant impact on badger habitat. However, should badgers occur on the site during project implementation, this may result in harm or mortality to individual badgers, and this would be considered a significant impact under CEQA.

**Mitigation**. Implementation of the following mitigation measures would reduce impacts to individual American badgers to a less-than-significant level.

***Avoidance***. Pre-construction surveys that will be conducted for burrowing owls will also be used to determine the presence or absence of badgers in the development and slope stabilization footprint, as well as within 300 feet of these areas.

If an active badger den is identified during pre-construction surveys within or immediately adjacent to any impacted areas, a construction-free buffer of up to 300 ft. (or distance specified by the resource agencies, i.e., CDFW) will be established around the den. Because badgers are known to use multiple burrows in a breeding burrow complex, a biological monitor should be present on the site during project development activities to ensure the buffer is adequate to avoid direct impact to individuals or den abandonment. The monitor would be necessary on the site until it is determined that young are of an independent age and project development activities would not harm individual badgers.

Once it has been determined that badgers have vacated the site, the burrows can be collapsed or excavated, and ground disturbance can proceed.

American badger is considered a focal species of the EACCS and general and species-specific avoidance and minimization measures included in the EACCS Biological Opinion which also will be implemented are included in Appendix B.

The above mitigation measures will lessen potential impacts to badgers to a less-than-significant level.

### 3.3.8 Potential Impact to Special Status Plant Species

**Potential Impact.** Of the special status plant species potentially occurring in the region (Table 2, Figure 5), most are considered absent from, or unlikely to occur on, the site due to a lack of suitable habitat such as vernal pools, and serpentine or alkaline soils, or because the site provides only marginal habitat for these species and they have never been observed in the project vicinity or have not been observed for many decades. Additionally, a focused rare plant survey conducted in May 2017 during the blooming season for several rare plant species having potential to occur on the site was able to rule out their presence on the site. One special status species has been observed to be present on the site in the past by both LOA (in 2012) and by Olberding. This latter species is Congdon's tarplant (CRPR 1B) (annual species; blooms June-November). Although three small populations were observed on the site by LOA in 2012, it has not been detected on the site during subsequent surveys conducted in 2014 through 2017, although not all of these surveys were conducted during its blooming period. Potential habitat for one other special status plant species, big tarplant (CRPR 1B) (annual species; blooms July-October), is also present on the site. Focused rare plant surveys in summer and fall 2017 are planned to determine whether either of these latter two species is present within areas of the site that will be disturbed as a result of development or slope stabilization. If the project would result in the loss of a significant portion of the regional population of any special status plant species, impacts may be considered significant under CEQA.

**Mitigation.** Should the botanical surveys confirm that special status plants are absent from the impacted areas of the site, then no mitigation would be required. If populations of these species are present, and if it is determined by a qualified botanist or plant ecologist that project impacts to these species are significant under CEQA, then the following mitigations will be implemented which will reduce impacts to a less-than-significant level.

***Avoidance.*** In consultation with a botanist or plant ecologist, and to the maximum extent feasible, the project will be designed to avoid substantial direct and indirect impacts (e.g. the establishment of an appropriate sized buffer) to these species.

***Compensation.*** If the project cannot be designed to avoid significant impacts to special status plant populations, then the following compensatory measures will be implemented.

*Onsite Preservation*. The onsite proposed open space area should be surveyed during the appropriate blooming season to determine whether populations of the species being significantly impacted by the project are also present within areas that will be preserved. If populations of the species are present on the preservation area, it should be determined by a qualified botanist or plant ecologist whether these populations to be preserved would adequately compensate, or partially compensate, for lost populations on the project site. If it is determined that preserved populations would completely compensate for impacted populations, then no further compensation would be required. However, if it is determined that populations of the impacted species are absent from the site, or that they are present but their preservation would only partially mitigate for lost populations, then additional mitigation measures described below will be implemented..

*Development of a Site Restoration Plan***.** If the project cannot be designed to avoid significant impacts to special status plants (as discussed above) and the preservation area does not support adequate populations of the impacted species to compensate for project impacts, then a Site Restoration Plan must be developed for the significantly impacted species by a qualified botanist or plant ecologist and approved by the City prior to the start of project development. The objective of this mitigation measure would be to replace the special status plants and habitat lost during project implementation. The proposed restoration program should be monitored for a period of five years from the date of site grading. The restoration plan should contain at a minimum the following:

- Identification of appropriate locations on the conservation area as determined by the botanist or plant ecologist (i.e., areas with suitable soils, aspect, hydrology, etc.) to restore lost plant populations.

- A description of the propagation and planting techniques to be employed in the restoration effort. Perennial plants to be impacted by site grading should be salvaged and raised in a greenhouse for eventual transplanting within the restoration areas. Annual plants can best be established by collecting seeds of onsite plants prior to project implementation and then directly seeding into suitable habitat on the conservation area.
- A timetable for implementation of the restoration plan.
- A monitoring plan and performance criteria.
- A description of remedial measures to be performed in the event that initial restoration measures are unsuccessful in meeting the performance criteria.
- A description of site maintenance activities to follow restoration activities. These may include weed control, irrigation, and control of herbivory by livestock and wildlife.

*Off-site Mitigation***.** If an onsite restoration plan is not feasible, mitigation for impacted special status plant species could be accommodated through restoration or preservation at an off-site location. Any off-site restoration plan would be subject to the same minimum requirements as indicated above for an onsite restoration plan.

If off-site preservation is the mitigation alternative chosen, then the mitigation site must be confirmed to support populations of the impacted species and must be preserved in perpetuity via deed restriction, establishment of a conservation easement, or similar preservation mechanism. A qualified botanist or plant ecologist should prepare a Preservation Plan for the site containing, at a minimum, the following elements:

- A monitoring plan and performance criteria for the preserved plant population.
- A description of remedial measures to be performed in the event that performance criteria are not met.
- A description of maintenance activities to be conducted on the site including weed control, trash removal, irrigation, and control of herbivory by livestock and wildlife.

The project proponent will be responsible for funding the development and implementation of any onsite or off-site Preservation Plan.

It should be noted that the Congdon's tarplant is a focal species under the EACCS and the EACCS includes a standardized mitigation ration for this species of 5:1. General and species-specific avoidance and minimization measures included in the EACCS Biological Opinion which also will be implemented are included in Appendix B.

### 3.3.9 Potential Impacts to Riparian Habitat and Other Sensitive Natural Communities, Including Federally Protected Wetlands

**Potential Impact.** Two wetland delineations have been conducted on the site, one by Olberding in 2008 which was subsequently verified by USACE, and one by LOA in January and April 2015. The second delineation was conducted due to the expiration of the Jurisdictional Determination (JD) for the prior delineation and because it appeared that the condition of wetlands on the site had changed since the 2008 delineation. A site verification visit was conducted with Keith Hess/USACE on June 30, 2016, however, although a new JD is forthcoming, at the time of the preparation of this report, it had not yet been issued by USACE. None the less, the final map submitted to USACE for verification arose from findings from the verification site visit and therefore will be the map on which the JD is expected to be issued.

The LOA delineation determined that there are four seasonal wetlands and four drainage channels on the site. Only Seasonal Wetland 4 in the western portion of the site near Alisal Street (0.45 acres) and Drainage 1 (205 linear feet) in the northern portion of the site which is a tributary to Sycamore Creek appear to be hydrologically connected other waters of the U.S. and therefore would be considered jurisdictional by USACE. The other hydrologic features appear to be isolated and therefore not considered jurisdictional by USACE, however, all the wetlands and channels of the site, whether they are isolated or not, would be considered jurisdictional by the RWQCB. For channels, the RWQCB's jurisdiction has recently been expanded to include the bed and bank of the channel. The on-site channels would also be considered jurisdictional by CDFW to the top of the bank.

The project will preserve most of the wetlands (totaling 1.28 acres) and all of the drainages (totaling 896 linear feet) occurring on the site. Slope stabilization will result in permanent impacts to Seasonal Wetland 2 (0.02 acres). This is a small wetland that is dominated by non-native wetland species such as canary grass, and which provides no additional ecological

functions and values over the surrounding upland habitat. In addition to the impacts to Seasonal Wetland 2, there will be temporary impacts to Seasonal Wetland 4 as a result of trenching for a pipeline to convey stormwater from a proposed onsite detention basin. Additionally, there is the potential for minor permanent impacts to Seasonal Wetland 4 as a result of the construction of an emergency vehicle access road (EVA). Plans for both the EVA and stormwater pipeline alignments have not yet been finalized as of the preparation of this report, but based on conversations with the project proponent and the project's civil engineer, we would expect that total temporary and permanent impacts to Seasonal Wetland 4 would be less than 0.05 acres.

The loss of 0.02 acres of marginal isolated wetland habitat (Seasonal Wetland 2) and temporary and permanent impacts totalling 0.05 acre or less of Seasonal Wetland 4, especially in light of the preservation of 1.28 acres of better quality wetland habitat within the open space areas of the site, would be considered a less-than-significant impact under CEQA.

**Mitigation.** None required.

*Regulatory issues.* While temporary and permanent impacts to less than 0.1 acre of marginal seasonal wetland habitats as a result of the project would be considered less-than-significant under CEQA, the applicant will need to comply with all state and federal regulations related to construction work that will impact aquatic habitats occurring on the site. The applicant may be required to obtain a Section 404 Clean Water Act Nationwide permit from the USACE and a Section 401 Water Quality Certification from the RWQCB prior to impacting any jurisdictional waters. As no channels will be impacted by the project, the applicant will not need to obtain a Section 1600 Streambed Alteration Agreement from the CDFW.

### 3.3.10 Potential Impacts to Special Status Animal Species

**Impact.** In addition to CTS, BUOW, and American badger, the project site provides potential habitat for several other special status animals that occur, or once occurred, in the project region (Table 2, Figure 5).

The site provides potential foraging habitat, but no breeding habitat, for four special status birds (white-tailed kite, Swainson's hawk, golden eagle, and loggerhead shrike) and two special status bat species (Townsend's big-eared bat and pallid bat). As already indicated above, the site

provides potential nesting and foraging habitat for another two bird species (northern harrier and grasshopper sparrow) which nest on the ground within grassland habitats. Mitigations to ensure that the project does not result in nest abandonment and mortality for these latter two species has already been provided.

All other special status species known to occur in the project region are considered absent from or unlikely to occur on the project site or its immediate vicinity due to the lack of suitable habitat.

The loss of breeding, roosting and foraging habitat for special status animals would be a less-than-significant impact of the project, given that project proposes to preserve approximately 81 acres of this habitat onsite and given that this habitat would remain regionally abundant.

**Mitigation.** None required.

### 3.3.11 Loss of Habitat for Non-special Status Native Wildlife

**Potential Impact.** The habitats of the proposed project site are likely to comprise only a portion of most native wildlife's entire home range or territory. As such, some species may disperse through the site, but most wildlife presently using the site do so as part of their normal movements for foraging, mating, and caring for young. Wildlife species presently occupying the site would be displaced or lost from the proposed development areas. The permanent loss of approximately 28 to 30 acres of grassland habitats on the site would be considered a less-than-significant impact of the project given that approximately 81 acres of such habitat will be preserved on the site and as this habitat remains regionally abundant.

**Mitigation.** None required.

### 3.3.12 Interference with the Movement of Native Wildlife

**Potential Impacts.** The project is unlikely to result in a significant impact to the movements of native wildlife. The proposed development area is surrounded by existing development on three sides and would not represent a movement corridor between adjacent habitats for native species. Therefore, impacts to wildlife movements are considered less-than-significant under CEQA.

**Mitigation.** None required.

### 3.3.13 Conflict with Local Policies or Ordinances

**Potential Impact.** The project is within Zone 11 of the study area of the East Alameda County Conservation Strategy for which a Programmatic Biological Opinion has been prepared (USFWS 2012) in which the project must follow guidelines for the Congdon's tarplant, CTS, western burrowing owl, and American badger as these species have the potential to occur onsite and are considered focal species of the EACCS. The project includes the preservation of approximately 81 acres of habitat. Although the preservation of approximately 81 acres is short of the EACCS' general land preservation ratio of 3:1 preservation:loss, it should be noted that the project proposes to preserve the highest quality habitat occurring on the site while proposing to develop areas of the site that have been used for hay production, and which provide lower quality habitat. Additionally, mitigation measures identified in this document will help to achieve goals and objectives defined in section 3.5 of the Conservation Strategy (ICF 2010). Lastly, the project will implement general and specific minimization measures from the EACCS Biological Opinion (USFWS 2012) for focal species potentially occurring on the site. These measures are provided in Appendix B.

There are no other local policies or ordinances pertaining to biological resources that would pertain to this project, as, for instance, the project does not propose the removal of any trees or development in the vicinity of any creeks, therefore, local tree ordinances and creek setback policies would not pertain to this project.

**Mitigation.** None required.

### 3.3.14 Degradation of Water Quality in Seasonal Creeks, Reservoirs and Downstream Waters

**Potential Impact.** The development of the site will require grading, excavation, and vegetation removal, thereby resulting in the project site becoming vulnerable to sheet, rill or gully erosion. Eroded soil is generally carried as sediment in surface runoff to be deposited in natural creek/river beds, canals, and adjacent wetlands.

To avoid or minimize sedimentation to offsite waters, the will be required to develop an erosion control plan. The applicant must also comply with standard erosion control measures that employ best management practices (BMPs), develop a SWPPP per State Water Quality Control Board

Stormwater Permit, and conform with the City's stormwater and grading requirements. If the applicant abides by the above requirements and obtains the required permits prior to starting the project, impacts to downstream waters from erosion and polluted stormwater runoff will be reduced to a less than significant level.

During project operation phase, runoff from the site will be detained in a detention basin in the western portion of the site, which will then drain via a pipe to existing stormwater pipelines located off-site to the west.

**Mitigation.** The applicant must comply with the provisions of a City grading permit, including standard erosion control measures that employ best management practices (BMPs). Projects involving the grading of large tracts of land must also be in compliance with provisions of a General Construction permit (a type of NPDES permit) available from the California Regional Water Quality Control Board. Compliance with the above permits should result in no impact to water quality in seasonal creeks, reservoirs, and downstream waters from the proposed project.

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## APPENDIX A: MINIMIZATION MEASURES FOR CALIFORNIA TIGER SALAMANDER

The following measures will minimize direct and indirect impacts to California tiger salamanders.

- Prior to the start of construction, a qualified biologist will train all project staff regarding habitat sensitivity, identification of special status species, and required practices. The training shall include the general measures that are being implemented to conserve these species as they relate to the project, the penalties for non-compliance, and the boundaries of the project area. A fact sheet or other supporting materials containing this information should be prepared and distributed. Upon completion of training, employees will sign a form stating that they attended the training and understand all the conservation and protection measures.

- A qualified biologist will survey the project site prior to, and be present to monitor, construction activities during any initial ground disturbance or vegetation clearing or other periods during construction, as necessary. The biologist will capture and relocate any California tiger salamanders that are discovered during the surveys or construction monitoring. Any individuals that are captured should be held for the minimum amount of time necessary to release them to suitable habitat outside of the work area.

- A qualified biologist will stake and flag exclusion zones around all known locations of CTS breeding and upland refugia areas in the construction zone. These areas will be avoided during construction activities to the maximum extent practicable. All construction areas will be flagged, and all activity will be confined to these areas.

- If a CTS is encountered during construction work, activities will cease until the animal is removed and relocated by a qualified biologist.

- Construction activities should be limited to the period from May 1 through October 31.

- Permanent and temporary construction disturbances and other types of project-related disturbances to CTS habitat shall be minimized to the maximum extent practicable and confined to the project site. To minimize temporary disturbances, all project-related vehicle traffic shall be restricted to established roads, construction areas, designated cross-country routes, and other designated areas. These areas also should be included in preconstruction surveys and, to the maximum extent possible, should be established in locations disturbed by previous activities to prevent further adverse effects. Sensitive habitat areas shall be delineated with high visibility flagging or fencing to prevent encroachment of construction personnel and equipment into any sensitive areas during project work activities. At no time shall equipment or personnel be allowed to adversely affect areas outside the project site without authorization from the Service.

- Because dusk and dawn are often the times when CTS are most actively foraging and dispersing, all construction activities should cease one half hour before sunset and should not begin prior to one half hour before sunrise.

- No canine or feline pets or firearms (except for federal, state, or local law enforcement officers and security personnel) shall be permitted at the project site to avoid harassment, killing, or injuring of CTS.

- A representative shall be appointed by the applicant who will be the contact source for any employee or contractor who might inadvertently kill or injure a CTS or who finds a dead, injured or entrapped individual. The representative shall be identified during the tailgate/training session. The representative's name and telephone number shall be provided to the Service prior to the initiation of ground disturbance activities.

- Tightly woven fiber netting or similar material shall be used for erosion control or other purposes at the project site to ensure that CTS do not get trapped.

- A litter control program shall be instituted at the entire project site. All construction personnel should ensure that food scraps, paper wrappers, food containers, cans, bottles, and other trash from the project area are deposited in covered or closed trash containers. The trash containers should be removed from the project area at the end of each working day.

# APPENDIX B: ADDITIONAL MINIMIZATION AND MITIGATION MEASURES FROM THE BIOLOGICAL OPINION FOR THE EAST ALAMEDA COUNTY CONSERVATION STRATEGY

**Table 3-2. General Avoidance and Minimization Measures to Reduce Effects on Focal Species**

| AMM Code | Avoidance and Minimization Measure |
|---|---|
| GEN-01 | Employees and contractors performing construction activities will receive environmental sensitivity training. Training will include review of environmental laws and Avoidance and Minimization Measures (AMMs) that must be followed by all personnel to reduce or avoid effects on covered species during construction activities. |
| GEN-02 | Environmental tailboard trainings will take place on an as-needed basis in the field. The environmental tailboard trainings will include a brief review of the biology of the covered species and guidelines that must be followed by all personnel to reduce or avoid negative effects to these species during construction activities. Directors, Managers, Superintendents, and the crew foremen and forewomen will be responsible for ensuring that crewmembers comply with the guidelines. |
| GEN-03 | Contracts with contractors, construction management firms, and subcontractors will obligate all contractors to comply with these requirements, AMMs. |
| GEN-04 | The following will not be allowed at or near work sites for covered activities: trash dumping, firearms, open fires (such as barbecues) not required by the activity, hunting, and pets (except for safety in remote locations). |
| GEN-05 | Vehicles and equipment will be parked on pavement, existing roads, and previously disturbed areas to the extent practicable. |
| GEN-06 | Off-road vehicle travel will be minimized. |
| GEN-07 | Vehicles will not exceed a speed limit of 15 mph on unpaved roads within natural land-cover types, or during off-road travel. |
| GEN-08 | Vehicles or equipment will not be refueled within 100 feet of a wetland, stream, or other waterway unless a bermed and lined refueling area is constructed. |
| GEN-09 | Vehicles shall be washed only at approved areas. No washing of vehicles shall occur at job sites. |
| GEN-10 | To discourage the introduction and establishment of invasive plant species, seed mixtures/straw used within natural vegetation will be either rice straw or weed-free straw. |
| GEN-11 | Pipes, culverts and similar materials greater than four inches in diameter, will be stored so as to prevent covered wildlife species from using these as temporary refuges, and these materials will be inspected each morning for the presence of animals prior to being moved. |
| GEN-12 | Erosion control measures will be implemented to reduce sedimentation in wetland habitat occupied by covered animal and plant species when activities are the source of potential erosion problems. Plastic mono-filament netting (erosion control matting) or similar material containing netting shall not be used at the project. Acceptable substitutes include coconut coir matting or tackified hydroseeding compounds. |
| GEN-13 | Stockpiling of material will occur such that direct effects to covered species are avoided. Stockpiling of material in riparian areas will occur outside of the top of bank, and preferably outside of the outer riparian dripline and will not exceed 30 days. |
| GEN-14 | Grading will be restricted to the minimum area necessary. |
| GEN-15 | Prior to ground disturbing activities in sensitive habitats, project construction boundaries and access areas will be flagged and temporarily fenced during construction to reduce the potential for vehicles and equipment to stray into adjacent habitats. |
| GEN-16 | Significant earth moving-activities will not be conducted in riparian areas within 24 hours of predicted storms or after major storms (defined as 1-inch of rain or more). |
| GEN-17 | Trenches will be backfilled as soon as possible. Open trenches will be searched each day prior to construction to ensure no covered species are trapped. Earthen escape ramps will be installed at intervals prescribed by a qualified biologist. |

**Table 3-3. Species-Specific AMMs**



| Species AMM | Species | Habitat | Avoidance and Minimization Measure |
|---|---|---|---|
| INV-1 | Vernal pool fairy shrimp, longhorn fairy shrimp | Vernal pools/clay flats, alkaline pools/rock outcrops/sandstone pools | • A qualified biological monitor will be present if work is conducted outside of designated work corridors or off of existing access roads.<br>• If vernal pools, clay flats, alkaline pools, ephemeral stock tanks, or sandstone pools, or roadside ditches are present, a qualified biologist will stake and flag an exclusion zone prior to construction activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the worksite and at least 250 feet from the aquatic feature wet or dry.<br>• Work will be avoided after the first significant rain until June 1, or until pools remain dry for 72 hours.<br>• No herbicide will be applied within 100 feet of exclusion zones, except when applied to cut stumps or frilled stems or injected into stems. No broadcast applications will be applied.<br>• Avoid modifying or changing the hydrology of the habitat. |
| INV-2 | Callippe silverspot butterfly | Grassland with host/nectar plants present | • No herbicide will be applied within 100 feet of host plant populations. Spot application to cut stumps, frilled stems, or injected into stems are acceptable. No broadcast applications will be applied.<br>• Cut trees that are removed in the vicinity of host plants will be hand carried rather than dragged to disposal areas.<br>• Avoid or minimize the removal of host plant, Johnny jump-up (*Viola pedunculata*)<br>• Avoid work in suitable habitat during the flight and mating season (mid-May to mid-July); establish a minimum 50-foot buffer around host plants. |
| AMPH-1 | <u>Amphibians</u><br>California tiger salamander<br>California red-legged frog<br>Foothill yellow-legged frog | Streams, wetlands, ponds, vernal pools | • If aquatic habitat is present, a qualified biologist will stake and flag an exclusion zone prior to activities. The exclusion zone will be fenced with orange construction zone and erosion control fencing (to be installed by construction crew). The exclusion zone will encompass the maximum practicable distance from the work site and at least 500 feet from the aquatic feature wet or dry. |
| AMPH-2 | <u>Amphibians</u><br>California tiger salamander<br>California red-legged frog<br>Foothill yellow-legged frog | Riparian habitat and grasslands within 2-miles of aquatic habitat. | • A qualified biologist will conduct preconstruction surveys prior to activities define a time for the surveys (before ground breaking). If individuals are found, work will not begin until they are moved out of the construction zone to a USFWS/CDFG approved relocation site.<br>• A Service-approved biologist should be present for initial ground disturbing activities.<br>• If the work site is within the typical dispersal distance (contact USFWS/CDFG for |

| Species AMM | Species | Habitat | Avoidance and Minimization Measure |
|---|---|---|---|
| | | | latest research on this distance for species of interest) of potential breeding habitat, barrier fencing will be constructed around the worksite to prevent amphibians from entering the work area. Barrier fencing will be removed within 72 hours of completion of work.<br>• No monofilament plastic will be used for erosion control.<br>• Construction personnel will inspect open trenches in the morning and evening for trapped amphibians.<br>• A qualified biologist possessing a valid ESA Section 10(a)(1)(A) permit or Service approved under an active biological opinion, will be contracted to trap and to move amphibians to nearby suitable habitat if amphibians are found inside fenced area.<br>• Work will be avoided within suitable habitat from October 15 (or the first measurable fall rain of 1" or greater, to May 1. |
| REPT-1 | Alameda whipsnake | Chaparral, scrub, grassland, riparian, oak woodland | • No monofilament plastic will be used for erosion control<br>• Barrier fencing may be used to exclude focal reptiles. Barrier fencing will be removed within 72 hours of completion of work.<br>• Construction crews or on-site biological monitor will inspect open trenches in the morning and evening for trapped reptiles.<br>• Ground disturbance in suitable habitat will be minimized.<br>• A USFWS and CDFG-approved biological monitor will be present for all ground disturbing activities in suitable habitat.<br>• A qualified biologist possessing a valid ESA Section 10(a)(1)(A) permit or Service approved under an active biological opinion, and approved by CDFG will be contracted to trap and to move reptiles to nearby suitable habitat if listed reptiles are found inside fenced area. |
| BIRD-1 | Golden eagle | Cliffs and large trees surrounded by open grassland. | • If an active nest is identified near a proposed work area work will be conducted outside of the nesting season (February 1 to September 1).<br>• If an active nest is identified near a proposed work area and work cannot be conducted outside of the nesting season, a no-activity zone will be established by a qualified biologist. The no-activity zone will be large enough to avoid nest abandonment and will at a minimum be 250-feet radius from the nest.<br>• If an effective no-activity zone cannot be established in either case, an experienced golden eagle biologist will develop a site-specific plan (i.e., a plan that considers the type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the eagles, and the dissimilarity of the proposed activity with background activities) to minimize the potential to affect the reproductive success of the eagles. |

| Species AMM | Species | Habitat | Avoidance and Minimization Measure |
|---|---|---|---|
| BIRD-2 | Burrowing owl | Grasslands or ruderal areas with burrows | • If an active nest is identified near a proposed work area work will be conducted outside of the nesting season (March 15 to September 1).<br>• If an active nest is identified near a proposed work area and work cannot be conducted outside of the nesting season, a no-activity zone will be established by a qualified biologist. The no-activity zone will be large enough to avoid nest abandonment and will at a minimum be 250-feet radius from the nest.<br>• If burrowing owls are present at the site during the non-breeding period, a qualified biologist will establish a no-activity zone of at least 150 feet.<br>• If an effective no-activity zone cannot be established in either case, an experienced burrowing owl biologist will develop a site-specific plan (i.e., a plan that considers the type and extent of the proposed activity, the duration and timing of the activity, the sensitivity and habituation of the owls, and the dissimilarity of the proposed activity with background activities) to minimize the potential to affect the reproductive success of the owls. |
| BIRD-3 | Tricolored blackbird | Wetlands, ponds with emergent vegetation | • If an active nest colony is identified near a proposed work area work will be conducted outside of the nesting season (March 15 to September 1). |
| MAMM-1 | San Joaquin kit fox, (American badger) | Grassland, generally with ground squirrel burrows | • If potential dens are present, their disturbance and destruction will be avoided.<br>• If potential dens are located within the proposed work area and cannot be avoided during construction, qualified biologist will determine if the dens are occupied or were recently occupied using methodology coordinated with the USFWS and CDFG. If unoccupied, the qualified biologist will collapse these dens by hand in accordance with USFWS procedures (U.S. Fish and Wildlife Service 1999).<br>• Exclusion zones will be implemented following USFWS procedures (U.S. Fish and Wildlife Service 1999) or the latest USFWS procedures available at the time. The radius of these zones will follow current standards or will be as follows: Potential Den—50 feet; Known Den—100 feet; Natal or Pupping Den—to be determined on a case-by-case basis in coordination with USFWS and CDFG.<br>• Pipes will be capped and trenches will contain exit ramps to avoid direct mortality while construction areas is active. |
| FISH-1 | Central California coast steelhead | Stream habitats | • If any life stage of any listed species may be present during in-water activities or substantial disturbance, capture, handling, exclusion, salvage, and relocation will be considered for the listed species. A take permit from NMFS would be required for this unless it is for emergency, then DFG.<br>• With the exception of streams identified by NMFS, and CDFG as not supporting spawning habitat, conduct all in-water activities outside the spawning and incubation season for listed fish species or to periods identified in cooperation with NMFS, and CDFG to accommodate site-specific conditions. |

| Species AMM | Species | Habitat | Avoidance and Minimization Measure |
|---|---|---|---|
| | | | • Preserve stream width, depth, velocity, and slope that provide upstream and downstream passage of adult and juvenile salmonid fish according to NMFS and CDFG guidelines and criteria or as developed in cooperation with NMFS and CDFG to accommodate site-specific conditions.<br>• Remove the minimum amount of wood, sediment and gravel, and other natural debris necessary to maintain and protect culvert and bridge function, ensure suitable fish passage conditions, and minimize disturbance of the streambed, using hand tools where feasible.<br>• Instream woody material (IWM) subject to damage or removal shall be retained and replaced on site after project completion or used for other mitigation/restoration projects near the project site where feasible.<br>• Minimize disturbed areas by locating temporary work areas to avoid patches of native aquatic vegetation, substantial large woody debris, and spawning gravel.<br>• Where spawning gravel removal is temporary to support construction activities, replace spawning gravel to approximate the pre-construction conditions and using gravel removed from the site.<br>• Gravel and LWD excavated from the channel that is temporarily stockpiled for reuse in the channel will be stored in a manner that prevents mixing with stream flows.<br>• For diversion from streams, rivers, and other water bodies, any water intake structure shall be installed, operated, and maintained in accordance with NMFS, and DFG criteria for the species and life stages of concern or as developed in cooperation with NMFS, USFWS, and DFG to accommodate site-specific conditions.<br>• Avoid extending existing areas of stream bank rock slope protection (RSP) or other bank protection (e.g., sheet piles) and limit the extent of bank and channel armoring to the minimum necessary to protect essential infrastructure.<br>• Where rock slope protection (RSP) is necessary, incorporate native riparian vegetation and/or LWD in RSP.<br>• Stream flow through new and replacement culverts, bridges, and over stream gradient control structures must meet the velocity depth, and other passage criteria for salmonid streams as described by NMFS and DFG guidelines or as developed in cooperation with NMFS and DFG to accommodate site-specific conditions.<br>• Pile driving shall be conducted outside of the stream channel whenever feasible or practical.<br>• Drive piles with a vibratory hammer when feasible.<br>• For drop or hydraulic hammers, use the smallest pile driver and the minimum force necessary to complete the work – set the hammer drop height to the minimum necessary to drive the pile.<br>• Where listed species cannot be captured, handled, excluded, or relocated (e.g., |

| Species AMM | Species | Habitat | Avoidance and Minimization Measure |
|---|---|---|---|
| | | | salmonid redd), avoid or delay actions that could injure or kill individual organism until the species leaves the affected area or the organism reaches a stage that can be captured, handled, excluded, or relocated . This activity would need to be coordinated with NMFS and the biologist conducting the work would need a take permit.<br>• Within occupied habitat, capture, handling, exclusion, and relocation activities shall be completed no earlier than 48 hours before construction begins to minimize the probability that listed species will recolonize the affected areas. This activity would need to be coordinated with NMFS and the biologist conducting the work would need a take permit.<br>• Within temporarily drained stream channel areas, salvage activities shall be initiated before or at the same time as stream area draining and completed within a time frame necessary to avoid injury and mortality of listed species. This activity would need to be coordinated with NMFS and the biologist conducting the work would need a take permit. |

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# C.3 - Results of the June 2018 Special Status Plant Survey Conducted on the Spotorno Ranch Project

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LIVE OAK ASSOCIATES, INC.
an Ecological Consulting Firm

June 27, 2018

Mike O'Hara
Tim Lewis Communities
3300 Douglas Blvd. Building 400,
Roseville, CA 95661

**SUBJECT: Results of the June 2018 special status plant survey conducted on the Spotorno Ranch project site, located in the City of Pleasanton, Alameda County, California (PN 1656-05).**

Dear Mike:

Live Oak Associates, Inc. (LOA) conducted a second focused survey for rare plants within areas proposed for residential development and landslide repair, including a 75-foot buffer, on the approximately Spotorno Ranch project site. The project site is located east of Alisal Street in the City of Pleasanton, Alameda County, California. The survey was conducted by LOA plant and wetland ecologist, Pamela Peterson on June 26, 2018.

## Introduction

Based on prior reconnaissance-level surveys conducted on the site by LOA ecologists Pamela Peterson and Katrina Krakow and a review of the California Natural Diversity Database (CNDDB) for preparation of a Biological Evaluation for CEQA, it was determined that the site had the potential to support the larval host plant for the federally-listed Callippe silverspot butterfly, i.e. viola (*Viola pedunculata*), as well as the potential to support four special status plant species: Congdon's tarplant (CRPR 1B) (annual species; blooms June-November), big tarplant (CRPR 1B) (annual species; blooms July-October), round-leaved filaree (CRPR 1B) (annual species; blooms March-May), and shining navarretia (CRPR 1B) (annual species; blooms May-July). Prior surveys of the site by Olberding and by LOA in 2014 did find one of these species, Congdon's tarplant, present on the site in small numbers in the western portion of the site, although surveys completed in the last two to three years have failed to detect this species. There are no CNDDB-documented occurrences of any of the four special status plant species within a three-mile radius of the site. None of the plant species is federally- or state-listed as endangered or threatened, however, but all of these species occur on CNPS List 1B ("Plants Rare, Threatened, or Endangered in California and elsewhere"). Project impacts to any of these species, if present, may be considered potentially significant under CEQA.

San Jose: 6840 Via del Oro, Suite 220 • San Jose, CA 95119 • Phone: (408) 224-8300 • Fax: (408) 224-1411
Oakhurst: P.O. Box 2697 • 49430 Road 426, Suite C • Oakhurst, CA 93644 • Phone: (559) 642-4880 • Fax: (559) 642-4883
Bakersfield: 8200 Stockdale Highway, M10-293 • Bakersfield, CA 93311

**Methods**

The June 2018 survey was timed to coincide with the blooming season for Congdon's tarplant and shining navarretia.

Ms. Peterson surveyed all areas of the project site occurring within the proposed limits of grading and/or landslide repairs, and a minimum 75-foot buffer of these areas, in all areas that provided suitable habitat for these species. The surveys were conducted on foot in such a way as to achieve 100% visual coverage of the site and to conform to the California Department of Fish and Wildlife's (CDFW) 2009 Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities.

All plant species encountered were identified to the taxonomic level necessary to determine whether it was a special status plant species using The Jepson Manual Second Edition (Baldwin et. al. 2012).

**Findings/Conclusions**

Appendix A provides a list of all vascular plant species that have thus far been encountered during site surveys.

During the June 2018 survey, grasses on the site were extremely dense and dominated by wild oats (Avena sp.). Grasses were mostly senescent, and plant diversity in all areas of the site surveyed was extremely low, and made up almost exclusively of non-native species, including wild oats (*Avena barbata* and *A. fatua*), wild-rye (*Festuca perennis*), field bindweed (*Convolvolus arvensis*), black mustard (*Brassica nigra*) and curly dock (*Rumex crispus*).

Findings from the survey were negative for the occurrence of Congdon's tarplant and shining navarretia. Therefore, the project is expected to result in no impacts to these two species. A prior survey in May 2018 ruled out the occurrence of all other special status plant species having potential to occur on the site except for big tarplant. A third and final late summer or fall survey will be required to ruleout the occurrence of this latter species on the site.

Please feel free to contact me at if you have any questions or concerns regarding our findings.

Sincerely,

Pamela E. Peterson
Senior Project Manager
Plant and Wetland Ecologist
408-281-5884

APPENDIX A: VASCULAR PLANTS OF THE STUDY AREA

The plant species listed below were observed on the Spotorno Ranch property during rare plant surveys conducted by Live Oak Associates on May 22, 2017 and June 26, 2018. The U.S. Army Corps of Engineers' wetland indicator status of each plant is provided following its common name.

OBL - Obligate
FACW - Facultative Wetland
FAC - Facultative
FACU - Facultative Upland
UPL - Upland

| | | |
|---|---|---|
| **APIACEAE – Carrot Family** | | |
| *Anthriscus caucalis** | Bur-chervil | UPL |
| *Torilis arvensis** | Field hedge parsley | UPL |
| **ASTERACEAE - Sunflower Family** | | |
| *Carduus pycnocephalus** | Italian thistle | UPL |
| *Centaurea solstitialis** | Yellow star-thistle | UPL |
| *Cirsium vulgare** | Bull thistle | FACU |
| *Cynara cardunculus** | Cardoon | UPL |
| *Helminthotheca echioides** | Bristly ox-tongue | FACU |
| *Hypochaeris radicata** | Rough cat's-ear | FACU |
| *Lactuca saligna** | Willowleaf lettuce | UPL |
| *Lactuca serriola** | Prickly lettuce | FACU |
| *Silybum marianum** | Milk thistle | UPL |
| *Sonchus asper** | Sow-thistle | FAC |
| *Taraxacum officinale** | Common dandelion | FACU |
| *Tragopogon sp.** | Salsify | UPL |
| **BRASSICACEAE – Mustard Family** | | |
| *Brassica nigra** | Mustard | UPL |
| *Lepidium nitidum* | Common peppergrass | FAC |
| **CARYOPHYLLACEAE – Pink Family** | | |
| *Cerastium fontanum** | Mouse ear chickweed | FACU |
| **CONVOLVULACEAE – Morning-Glory Family** | | |
| *Convolvulus arvensis** | Field bindweed | UPL |
| **CYPERACEAE – Sedge Family** | | |
| *Eleocharis macrostachya* | Spikerush | OBL |
| **EUPHORBIACEAE – Spurge Family** | | |

| | | |
|---|---|---|
| *Croton setiger* | Doveweed | UPL |
| **FABACEAE – Legume Family** | | |
| *Lotus corniculatus** | Birdfoot trefoil | FAC |
| *Medicago polymorpha** | Burclover | FACU |
| *Trifolium hirtum** | Rose clover | UPL |
| *Vicia sativa* ssp. *sativa** | Spring vetch | FACU |
| **GERANIACEAE – Geranium Family** | | |
| *Erodium cicutarium** | Redstem filaree | UPL |
| *Geranium dissectum** | Wild geranium | UPL |
| **JUNCACEAE – Rush Family** | | |
| *Juncus sp.* | Rush | FACW-OBL |
| *Juncus xiphioides* | Iris-leaved rush | OBL |
| **LYTHRACEAE – Loosestrife Family** | | |
| *Lythrum hyssopifolia** | Hyssop loosestrife | OBL |
| **MYRSINACEAE – Myrsine Family** | | |
| *Lysimachia arvensis** | Scarlet pimpernel | FAC |
| **PLANTAGINACEAE – Plantain Family** | | |
| *Plantago lanceolata** | English plantain | FAC |
| **POACEAE - Grass Family** | | |
| *Aegilops triuncialis** | Barbed goatgrass | UPL |
| *Briza minor** | Small quaking grass | FAC |
| *Bromus diandrus** | Ripgut brome | UPL |
| *Bromus hordeaceus** | Soft chess | FACU |
| *Elymus triticoides* | Creeping wild-rye | FAC |
| *Festuca perennis** | Italian ryegrass | FAC |
| *Hordeum brachyantherum* | Meadow barley | FACW |
| *Hordeum murinum** | Foxtail barley | FACU |
| *Hordeum marinum* ssp. *leporinum** | Mediterranean barley | FAC |
| *Phalaris paradoxa** | Hood canarygrass | FAC |
| *Polypogon monspeliensis** | Rabbitsfoot grass | FACW |
| **POLYGONACEAE – Knotweed Family** | | |
| *Rumex acetosella** | Common sheep sorrel | FACU |
| *Rumex crispus** | Curly dock | FAC |
| **RUBIACEAE – Madder Family** | | |
| *Galium aparine** | Goose grass | FACU |

* Introduced non-native species

# Appendix D:
# Cultural Resources Supporting Information

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# D.1 - Phase I Cultural Resources Assessment

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FIRSTCARBONSOLUTIONS™

# Phase I Cultural and Paleontological Resources Assessment
# Spotorno Ranch Project
# Initial Study/Mitigated Negative Declaration
# City of Pleasanton, Alameda, California

USGS Livermore and Dublin 7.5 minute Quadrangle Map
Township 3 South, Range 1 East, Section 28

CONFIDENTIAL - NOT FOR PUBLIC DISTRIBUTION

Prepared for:
**City of Pleasanton**
Planning Department
200 Bernal Avenue
Pleasanton, CA 94566
925.931.5615

Contact: Jenny Soo, Associate Planner

Prepared by:
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
925.357.2562

Fieldwork conducted by: Dana DePietro, PhD
Fieldwork conducted on: March 7, 2018
Report Date: April 11, 2018

Please note this report contains sensitive information pertaining to Native American Cultural Resources and is not intended for public distribution pursuant to Pub. Resources Code, § 21082.3(c)(2)).

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# MANAGEMENT SUMMARY

At the request of the City of Pleasanton, FirstCarbon Solutions (FCS) conducted a Phase I Cultural and Paleontological Resources Assessment of the proposed project site located within the City of Pleasanton, Alameda County, California. The project site is located at 6656 Alisal Street in the City of Pleasanton. The project site consists of two parcels designated by Assessor Parcel Numbers (APNs) 948-0015-002-01 and 949-0014-001-00 (USGS Livermore and Dublin 7.5 minute Quadrangle Map Township 3 South, Range 1 East, Section 28 Latitude 37°40'21"N 121°52'57"W).

The project applicant is proposing to develop 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan (HVSP). The site contains two parcels and is currently vacant. The project site fronts Alisal Street and Westbridge Lane. All homes would be developed to the standards set forth in the HVSP, in which the Project site resides. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of open space. The project would also include the elimination of the bypass road that was contemplated in the HVSP to funnel traffic from the municipal golf course and surrounding residential uses to city streets located to the north and west of the project site. Access to the project site would be provided by Alisal Street.

The purpose of this assessment is to identify the presence or absence of potentially significant cultural resources within the project area and, if impacted by the proposed development, propose recommendations for mitigation. Completion of this investigation fulfills the requirements associated with the California Environmental Quality Act (CEQA). This report follows the California Office of Historic Preservation (OHP) procedures for cultural resource surveys and the OHP's Archaeological Resource Management Report (ARMR) format for archaeological reports.

On February 15, 2018, FCS staff conducted a records search for the project area and a 0.5-mile radius beyond the project boundaries at the Northwest Information Center (NWIC) located at California State University Sonoma. To identify any historic properties or resources, the current inventories of the National Register of Historic Places (NR), the California Register of Historic Resources (CR), the California Historical Landmarks list, the California Points of Historical Interest list, and the California State Historic Resources Inventory were reviewed to determine the existence of previously documented local historical resources. Results from the NWIC indicate that four resources have been recorded within 0.5 mile of the project area. In addition, seven area-specific survey reports are on file with the NWIC for the search radius, one of which previously addressed the project development area.

On January 30, 2018, FCS sent a letter to the Native American Heritage Commission (NAHC) in an effort to determine whether any sacred sites are listed on its Sacred Lands File for the project area. A response was received on March 1, 2018 indicating that the Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate project area. The NAHC included a list of six tribal representatives available for consultation. To ensure that all Native American knowledge and concerns over potential Tribal Cultural Resources (TCRs) that may be affected by the project are addressed, a letter containing project information and requesting any additional

information was sent to each tribal representative on March 6, 2018. No responses have been received to date.

On March 7, 2018, FCS Senior Archaeologist Dana DePietro surveyed the project area for additional unrecorded cultural resources. The survey began in the southwest corner of the project site and moved east, using north-south transects spaced at 15-meter intervals whenever possible. Survey conditions were documented using digital photographs and field notes. Particular attention was paid to the southeast of the project area, as it is in closer proximity to known cultural and natural resources in the area. Water and natural resources are traditionally considered to have higher potential for cultural sensitivity as they were attractive locations for prehistoric human settlement, such as CA-ALA-00024, a known habitation site associated with a creek immediately southwest of the project area. No historic or prehistoric cultural resources or raw materials commonly used in the manufacture of tools (e.g., obsidian, Franciscan chert) were found in these areas, nor were any observed elsewhere within the project site.

On February 23, 2018, consulting paleontologist Dr. Ken Finger performed a records search on the UCMP database for the Spotorno project site in Alameda County. According to the geologic map of Graymer et al. (2006), the Spotorno project site is located on Pleistocene alluvium (Qpa), early Pleistocene and/or Pliocene sediments (QTs), and Miocene sedimentary rocks (Tms). All three of these units have the potential to yield significant paleontological resources. The UCMP database records lists 64 Pleistocene vertebrate fossil localities in Alameda County, which have yielded a total of 1,071 specimens. In addition, the UCMP database also lists specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch.

Based on the results of the records searches, Native American correspondence, and pedestrian survey, FCS considers the potential for the project to have an adverse effect on historic or prehistoric cultural resources to be moderate. Four resources have been recorded within a 0.5-mile radius of the project site, one of which appears to be a potentially significant prehistoric archaeological site (CA-ALA-00024). FCS therefore recommends that a qualified archaeologist be present during the initial phase of ground disturbance and grading in order to check for the inadvertent exposure of cultural materials. This may be followed by regular periodic or “spot-check” archaeological monitoring as needed, but full-time archaeological monitoring is not recommended at this time.

Based on Dr. Finger’s report, which concluded all three geologic units have the potential to yield significant paleontological resources, FCS considers the potential for the project to have an adverse effect on paleontological resources to be moderate to high. FCS therefore recommends that a professional paleontologist be present during the initial phase of ground disturbance to check for the inadvertent exposure of fossils or other resources of paleontological value. This may be followed by regular periodic or “spot-check” monitoring as needed, but full-time paleontological monitoring is not required at this time.

# SECTION 1: INTRODUCTION

## 1.1 - Project Location

The project site is located in the southern portion of the City of Pleasanton, Alameda County, California (Exhibit 1). As shown in Exhibit 2, the site is roughly bounded by Alisal Street on the west, Westbridge Lane to the south and undeveloped hills to the east. The topography of the site is varied, with hills and ridgelines in the in the northern and eastern portions of the site (Spotorno Hill) and flat terrain in the west (Spotorno Flat). The project site consists of two parcels designated by APNs 940-0016-006 and 948-015-002-01 (USGS Livermore and Dublin 7.5 minute Quadrangle Map Township 3 South, Range 1 East Section 28 Latitude is 37°40’21”N 121°52’57”W (Exhibit 3).

## 1.2 - Project Description

The project would consist of the development of 39 single-family residents on approximately 30-acres and permanently preserve approximately 124-acres as open space. Lot sizes would range between 22,024 and 38,311 square feet, for an average lot size of 27,394 square feet. The minimum depth of excavation for each home site would be 140 feet. Each home site would have a minimum front yard setback of 35 feet, with a side yard setback of 25 feet and a rear setback of 35 feet. A 2.01-acre undeveloped parcel in the western portion of the site that contains wetlands would be preserved. The project would include a bio-retention pond located within the west corner of the project site.

## 1.3 - Assessment Team

FCS Senior Archaeologist Dana DePietro, PhD conducted the pedestrian survey and authored this report. Professional qualifications for Dr. DePietro can be found in Appendix C.

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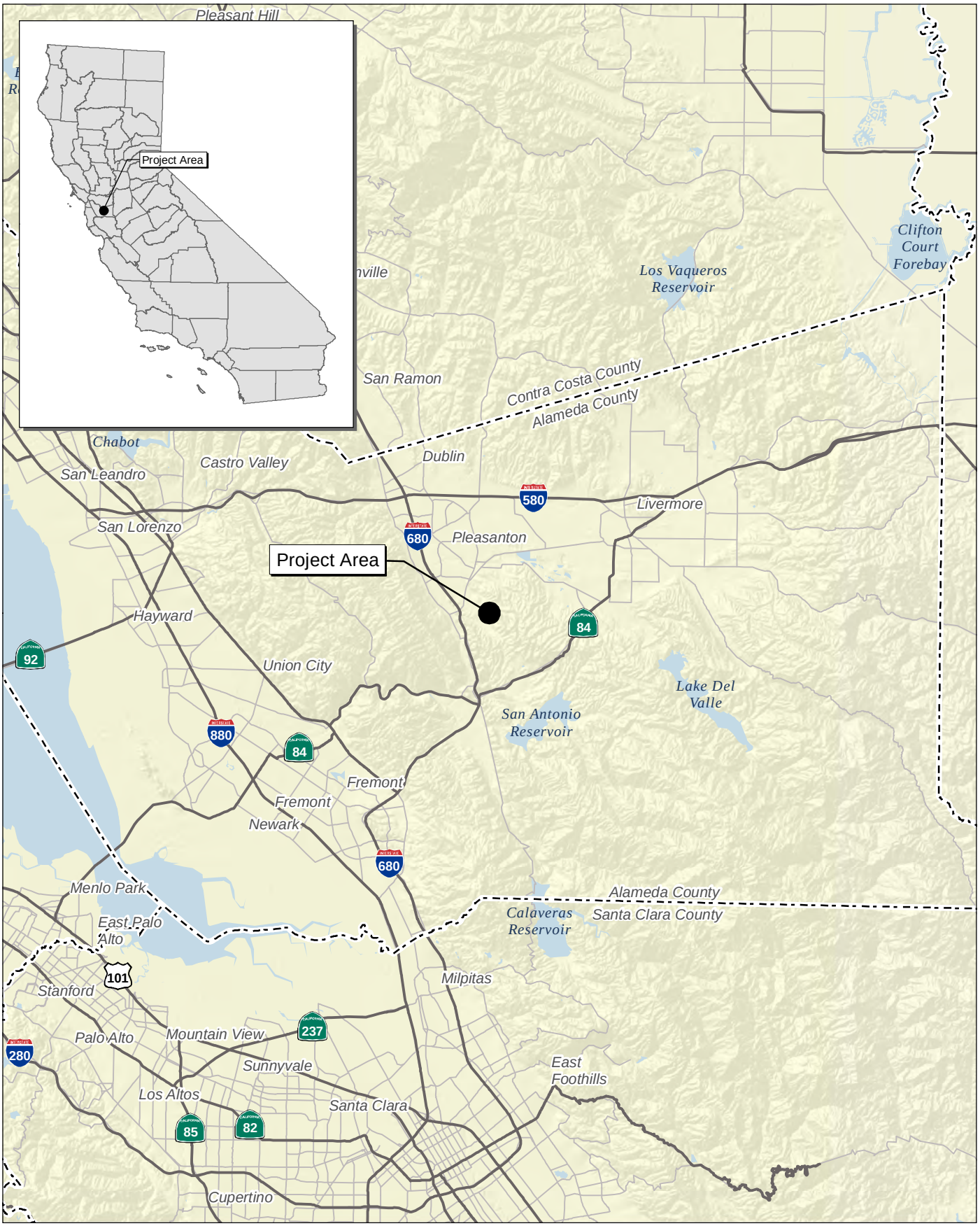


Source: Census 2000 Data, The CaSIL.

FIRSTCARBON SOLUTIONS™

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Exhibit 1
Regional Location Map

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CITY OF PLEASANTON • SPOTORNO RANCH PROJECT
PHASE I CULTURAL AND PALEONTOLOGICAL RESOURCES ASSESSMENT

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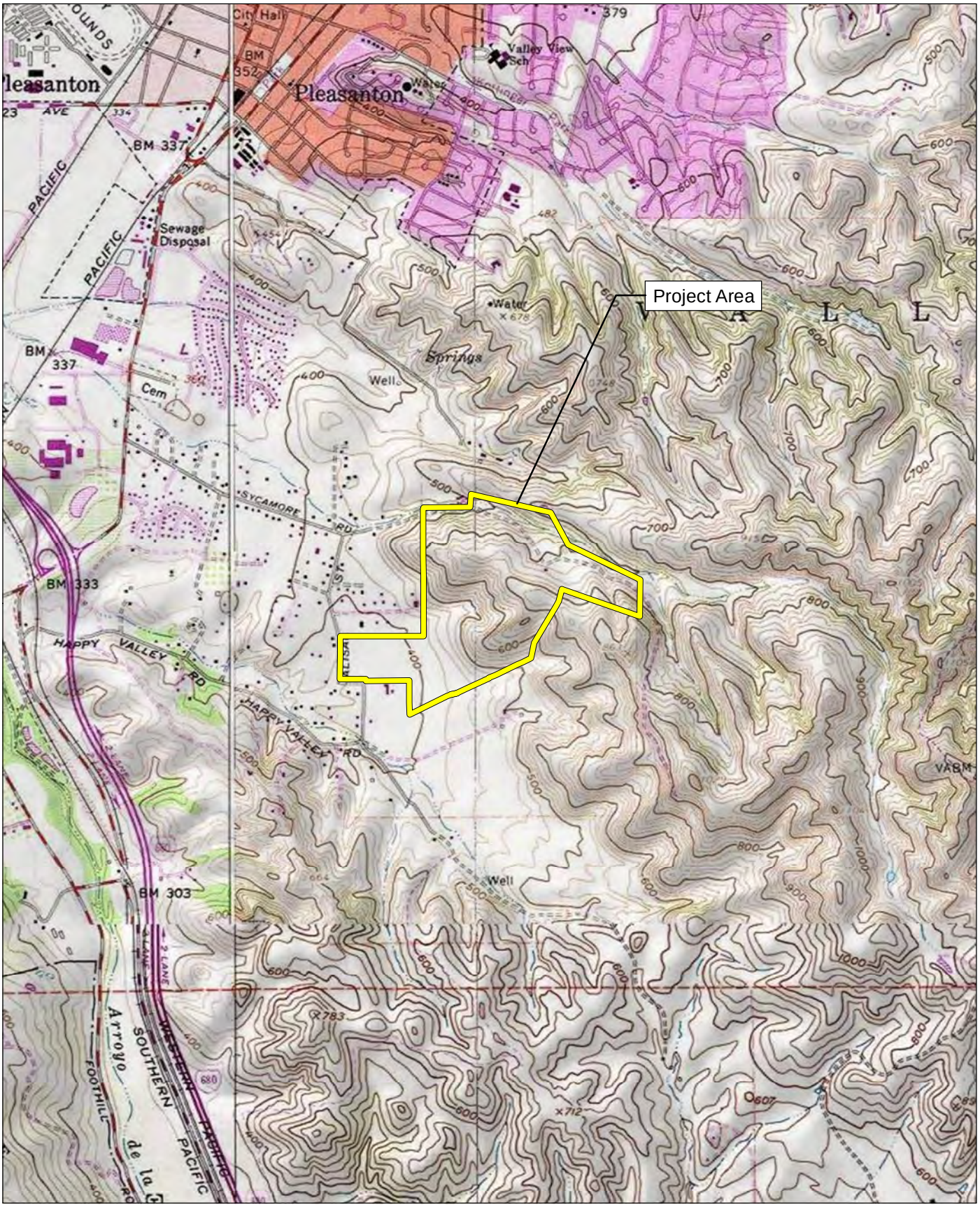


Source: USGS Livermore and dublin 7.5' Quadrangles / T3S,R1E,sec28

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Exhibit 2
Local Vicinity Map
Topographic Base

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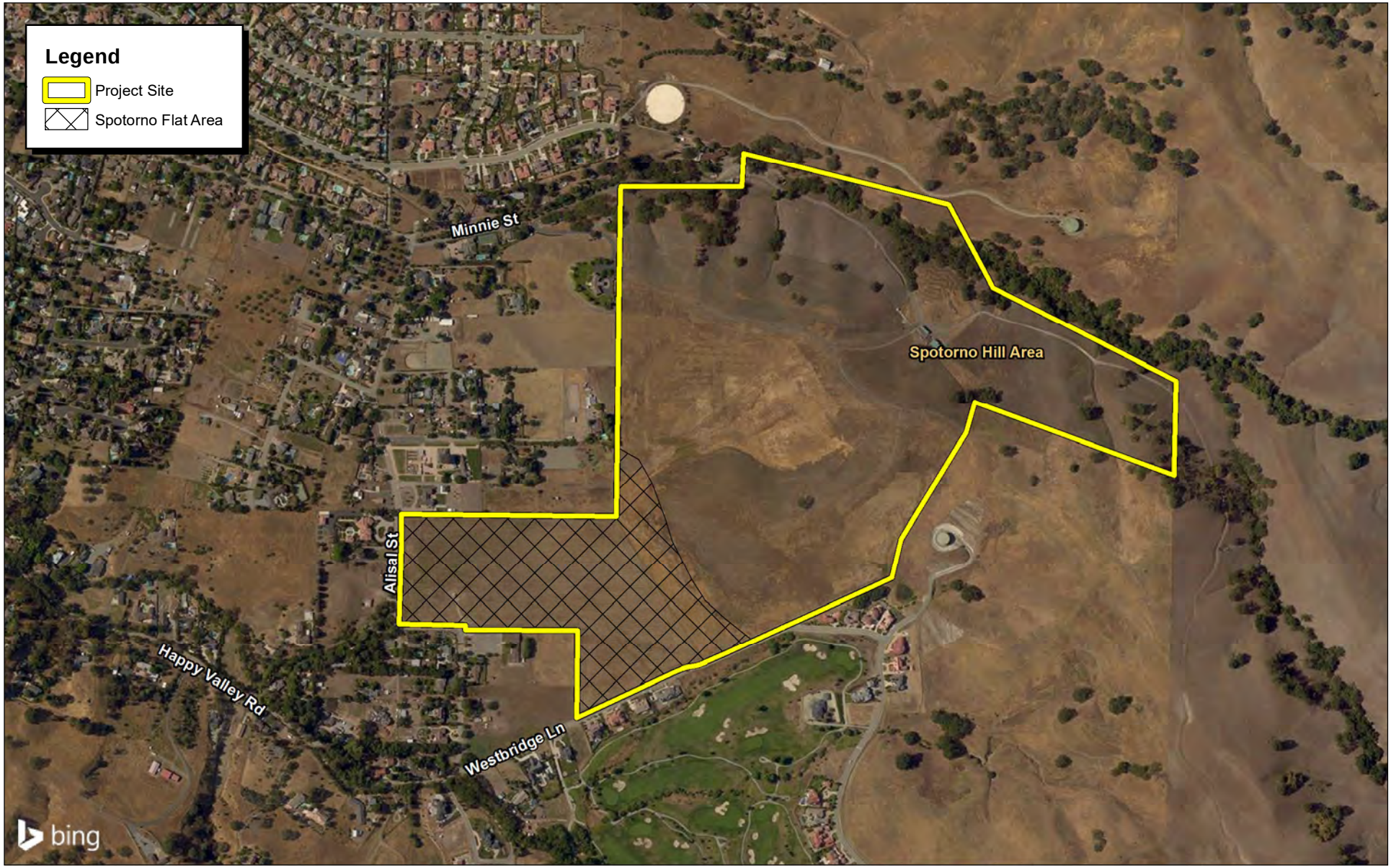


Source: bing Aerial Imagery. Ruggeri, Jensen, Azar, 2015

FIRSTCARBON SOLUTIONS™

800 400 0 800 Feet

Exhibit 3
Local Vicinity Map
Aerial Base

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# SECTION 2: CULTURAL SETTING

Following is a brief overview of the prehistory, ethnography, and historic background, providing a context in which to understand the background and relevance of sites found in the general project area. This section is not intended to be a comprehensive review of the current resources available; rather, it serves as a general overview. Further details can be found in ethnographic studies, mission records, and major published sources.

## 2.1 - Prehistoric Background

Early archaeological investigations in California were conducted at sites located in the Sacramento-San Joaquin Delta region. The first published account documents investigations in the Lodi and Stockton area (Schenck and Dawson 1929). The initial archaeological reports typically contained descriptive narratives, with more systematic approaches sponsored by Sacramento Junior College in the 1930s. At the same time, University of California at Berkeley excavated several sites in the lower Sacramento Valley and Delta region, which resulted in recognizing archaeological site patterns based on variations of inter-site assemblages. Research during the 1930s identified temporal periods in central California prehistory and provided an initial chronological sequence (Lillard and Purves 1936; Lillard et al. 1939). In 1939, Lillard noted that each cultural period led directly to the next and that influences spread from the Delta region to other regions in central California (Lillard et al. 1939). In the late 1940s and early 1950s, Beardsley documented similarities in artifacts among sites in the San Francisco Bay region and the Delta and refined his findings into a cultural model that ultimately became known as the Central California Taxonomic System (CCTS). This system proposed a uniform, linear sequence of cultural succession (Beardsley 1948 and 1954). The CCTS system was challenged by Gerow, whose work looked at radiocarbon dating to show that Early and Middle Horizon sites were not subsequent developments but, at least partially, contemporaneous (1954; 1974; Gerow with Force 1968).

To address some of the flaws in the CCTS system, Fredrickson (1973) introduced a revision that incorporated a system of spatial and cultural integrative units. Fredrickson separated cultural, temporal, and spatial units from each other and assigned them to six chronological periods: Paleo-Indian (10000 to 6000 B.C.); Lower, Middle and Upper Archaic (6000 B.C. to A.D. 500), and Emergent (Upper and Lower, A.D. 500 to 1800). The suggested temporal ranges are similar to earlier horizons, which are broad cultural units that can be arranged in a temporal sequence (Moratto 1984). In addition, Fredrickson defined several patterns—a general way of life shared within a specific geographical region. These patterns include:

- Windmiller Pattern or Early Horizon (3000 to 1000 B.C.)
- Berkeley Pattern or Middle Horizon (1000 B.C. to A.D. 500)
- Augustine Pattern or Late Horizon (A.D. 500 to historic period)

Brief descriptions of these temporal ranges and their unique characteristics follow.

### 2.1.1 - Early Horizon or Windmiller Pattern (3000 to 1000 B.C.)

Characterized by the Windmiller Pattern, the Early Horizon was centered in the Cosumnes district of the Delta and emphasized hunting rather than gathering, as evidenced by the abundance of projectile points in relation to plant processing tools. Additionally, atlatl, dart, and spear technologies typically included stemmed projectile points of slate and chert but minimal obsidian. The large variety of projectile point types and faunal remains suggests exploitation of numerous types of terrestrial and aquatic species (Bennyhoff 1950; Ragir 1972). Burials occurred in cemeteries and intra-village graves. These burials typically were ventrally extended, although some dorsal extensions are known with a westerly orientation and a high number of grave goods. Trade networks focused on acquisition of ornamental and ceremonial objects in finished form rather than on raw material. The presence of artifacts made of exotic materials such as quartz, obsidian, and shell indicates an extensive trade network that may represent the arrival of Utian populations into central California. Also indicative of this period are rectangular *Haliotis* and *Olivella* shell beads, and charmstones that usually were perforated.

### 2.1.2 - Middle Horizon or Berkeley Pattern (1000 B.C. to A.D. 500)

The Middle Horizon is characterized by the Berkeley Pattern, which displays considerable changes from the Early Horizon. This period exhibited a strong milling technology represented by minimally shaped cobble mortars and pestles, although metates and manos were still used. Dart and atlatl technologies during this period were characterized by non-stemmed projectile points made primarily of obsidian. Fredrickson (1973) suggests that the Berkeley Pattern marked the eastward expansion of Miwok groups from the San Francisco Bay Area. Compared with the Early Horizon, there is a higher proportion of grinding implements at this time, implying an emphasis on plant resources rather than on hunting. Typical burials occurred within the village with flexed positions, variable cardinal orientation, and some cremations. As noted by Lillard, the practice of spreading ground ochre over the burial was common at this time (Lillard et al. 1939). Grave goods during this period are generally sparse and typically include only utilitarian items and a few ornamental objects. However, objects such as charmstones, quartz crystals, and bone whistles occasionally were present, which suggest the religious or ceremonial significance of the individual (Hughes 1994). During this period, larger populations are suggested by the number and depth of sites compared with the Windmiller Pattern. According to Fredrickson (1973), the Berkeley Pattern reflects gradual expansion or assimilation of different populations rather than sudden population replacement and a gradual shift in economic emphasis.

### 2.1.3 - Late Horizon or Augustine Pattern (A.D. 500 to Historic Period)

The Late Horizon is characterized by the Augustine Pattern, which represents a shift in the general subsistence pattern. Changes include the introduction of bow and arrow technology; and most importantly, acorns became the predominant food resource. Trade systems expanded to include raw resources as well as finished products. There are more baked clay artifacts and extensive use of Haliotis ornaments of many elaborate shapes and forms. Burial patterns retained the use of flexed burials with variable orientation, but there was a reduction in the use of ochre and widespread evidence of cremation (Moratto 1984). Judging from the number and types of grave goods associated with the two types of burials, cremation seems to have been reserved for individuals of

higher status, whereas other individuals were buried in flexed positions. Johnson (1976) suggests that the Augustine Pattern represents expansion of the Wintuan population from the north, which resulted in combining new traits with those established during the Berkeley Pattern.

Central California research has expanded from an emphasis on defining chronological and cultural units to a more comprehensive look at settlement and subsistence systems. This shift is illustrated by the early use of burials to identify mortuary assemblages and more recent research using osteological data to determine the health of prehistoric populations (Dickel et al. 1984). Although debate continues over a single model or sequence for central California, the general framework consisting of three temporal/cultural units is generally accepted, although the identification of regional and local variation is a major goal of current archaeological research.

## 2.2 - Native American Background

### 2.2.1 - The Ohlone (Costanoan)

At the time of European contact, the project vicinity was occupied by various tribelets that were part of the Ohlone (previously Costanoan) tribe of California Native Americans (Levy 1978). The Ohlone group designates a language family consisting of eight branches of the Ohlone language that are considered too distinct to be dialects, wherein each is related to its geographically adjacent neighbors. These groups lived in approximately 50 separate and politically autonomous tribelet areas, each with one or more permanent villages, between the North San Francisco Bay and the lower Salinas River (Levy 1978).

The arrival of Ohlone groups into the Bay Area appears to be temporally consistent with the appearance of the Late Period artifact assemblage in the archaeological record, as documented at sites south of the project area such as the Emeryville Shellmound or the Ellis Landing Shellmound. It is probable that the Ohlone moved south and west from the delta region of the San Joaquin-Sacramento River into the Bay Area during the Late Prehistoric. The tribal group that most likely occupied the project area was of the Karkin ethnic group, whose territory extended over the Carquinez Strait region in the northeast portion of the San Francisco Bay estuary. They spoke the Karkin language, which was documented by linguist-missionary Felipe Arroyo de la Cuesta at Mission Dolores in 1821. His records show that the Karkin language was a distinct branch of Costanoan, strikingly different from the neighboring Chochenyo Ohlone language or other Ohlone languages spoken farther south. Their direct neighbors to the east may have been tribelets associated with Northern Valley Yokuts people.

The most current information indicates that at the time of the Spanish invasion, the Pelnen tribe of Ohlones/Costanoans inhabited the general project area vicinity and another smaller group, the Causen, were located in Sunol Valley. These two groups were intermarried and possibly part of a larger tribe in the Pleasanton/Sunol area villages (Clark, 2015). Clearly the project area vicinity was permanently occupied with small permanent and seasonally occupied villages at the time. The project region was used aboriginally for habitation and specific locales for specific tasks, such as gathering and processing food resources.

The various Ohlone tribes subsisted as hunter-gatherers and relied on local terrestrial and marine flora and fauna for subsistence (Levy 1978). The predominant plant food source was the acorn, but they also exploited a wide range of other plants, including various seeds, buckeye, berries, and roots. Protein sources included grizzly bear, elk, sea lions, antelope, and black-tailed deer as well as smaller mammals such as raccoon, brush rabbit, ground squirrels, and wood rats. Waterfowl, including Canadian geese, mallards, green-winged teal, and American widgeon, were captured in nets using decoys to attract them. Fish also played an important role in the Ohlone diet and included steelhead, salmon, and sturgeon (Jones 2007). Like other native Californians, the Ohlone managed their environment to improve it for their use. For example, the Ohlone burned grass and brush lands annually in order to improve productivity of forage habitat for deer and rabbits and safety by keeping the land open with clear sight lines to better spot predators or neighbors.

The Ohlone constructed watercraft from tule reeds and possessed bow and arrow technology. They fashioned blankets from sea otter pelts, fabricated basketry from twined reeds of various types, and assembled a variety of stone and bone tools in their assemblages. Ohlone villages typically consisted of domed dwelling structures, communal sweathouses, dance enclosures, and assembly houses constructed from thatched tule reeds and a combination of wild grasses, wild alfalfa, and ferns.

The Ohlone were politically organized into autonomous tribelets that had distinct cultural territories. Individual tribelets contained one or more villages with a number of seasonal camps for resource procurement within the tribelet territory. The tribelet chief could be either male or female, and the position was inherited patrilineally, but approval of the community was required. The tribelet chief and council were essentially advisors to the community and were responsible for feeding visitors, directing hunting and fishing expeditions, ceremonial activities, and warfare on neighboring tribelets.

The Gold Rush brought disease to the native inhabitants, and by the 1850s, nearly all of the Ohlone had adapted in some way or another to economies based on cash income. Hunting and gathering activities continued to decline and were rapidly replaced with economies based on ranching and farming (Levy 1978).

## 2.3 - Historical Background

### 2.3.1 - Spanish and Mexican California

Spanish exploration into the Central Valley dates back to the late 1700s. Spanish mission records indicate that by 1800, Costanoan speaking peoples, and other villages were being taken to Mission Dolores, and that Mission Sonoma, built in 1823, was baptizing tribal members until secularization of the missions in 1833. Many Native Americans were not willing converts: there are numerous accounts of neophytes fleeing the missions, and a series of “Indian Wars” broke out when the Spanish tried to return them to the missions (Johnson 1978). During this period, Native American populations were declining rapidly because of an influx of Euro-American diseases. In 1832, a party of trappers from the Hudson’s Bay Company, led by John Work, traveled down the Sacramento River, unintentionally spreading a malaria epidemic to Native Californians. Four years later, a smallpox epidemic decimated local populations. (Cook 1955).

The Mexican Period, 1821 to 1848, was marked by secularization and division of mission lands among the *Californios* as land grants, termed ranchos. During this period, Mariano G. Vallejo assumed authority of Sonoma Mission and established a friendly relationship with the Native Americans who were living there. In particular, Vallejo worked closely with Chief Solano, a Patwin who served as Vallejo's spokesperson when problems with Native American tribes arose. The large rancho lands often were worked by Native Americans who were used as forced labor.

### 2.3.2 - The Gold Rush and American Expansion

In 1848, James W. Marshall discovered gold at Coloma in modern-day El Dorado County, which started the gold rush into the region that forever altered the course of California's history. The arrival of thousands of gold seekers in the territory contributed to the exploration and settlement of the entire state. By late 1848, approximately four out of five men in California were gold miners (Robinson 1948). The gold rush originated along the reaches of the American River and other tributaries to the Sacramento River, and Hangtown, present-day Placerville, became the closest town offering mining supplies and other necessities for the miners in El Dorado County. Gold subsequently was found in the tributaries to the San Joaquin River, which flowed north to join the Sacramento River in the great delta east of San Francisco Bay.

As mining spread, mining techniques changed. Initially, miners relied on gold panning in a shallow pan until the heavier, gold-bearing materials fell to the bottom while the water and lighter sand spilled out over the rim. This technique was displaced by simple mining machines like the wooden "rocker" into which pails of water were emptied and processed at one time. The gold in and around stream beds was soon exhausted, and hard-rock mining took over, digging shafts up to 40 feet deep with horizontal tunnels radiating from these shafts in search of subterranean veins of gold-bearing quartz (VSFWM 2006).

By 1864, California's gold rush had essentially ended. The rich surface and river placers were largely exhausted and the miners either returned to their homelands or stayed to start new lives in California. After the gold rush, people in towns such as Jackson, Placerville, and Sonora turned to other means of commerce, such as ranching, agriculture, and timber production. With the decline of gold mining, agriculture and ranching came to the forefront in the State's economy. California's natural resources and moderate climate proved well suited for cultivation of a variety of fruits, nuts, vegetables, and grains (Beck and Haase 1974).

### 2.3.3 - Alameda County

Alameda County occupies the eastern portion of the East Bay region of the San Francisco Bay Area region. The county was formed in March of 1853 from portions of Contra Costa and Santa Clara counties. Alameda county, like much of California, was seen as a land of economic opportunity, not just for its mining resources but also for its productive land where farmers could cultivate a variety of crops. Agriculture became important in the California economy in the late 1850s, and through to the 1860s, homesteading became a means by which people could own and operate a family farm. The decidedly agricultural focus also underpins the historical significance of the Spanish colonial and Mexican era of land grants. The variety of cultural traditions, technological developments, and

ideological views further underwrite the County's agricultural history. The County's rural setting continues to support farming and ranching operations.

As early as 1887, special interests advertised the County's virtues as a place to cultivate. Early settlers began to speak of beneficial soils that support a range of crops—oranges, lemons, olives, pomegranates, figs, and grapes flourished—with seasonal rainfall, and suitable climates. In addition, the welcoming character of towns, regional accessibility, and schools further encouraged westward migration.

A variety of crops flourished in the County because of favorable sub-climate conditions. Cultivated lands expanded with changes and advancements in the agricultural industry that encouraged farmers to adapt operations and remain relevant. More generally, stable crops such as wheat and specialty crop agriculture were an important component of California's agricultural history. Between 1880 and 1900, for example, farmers shifted from apples to such fruits as peaches, plums, prunes, apricots, and pears. The shift boosted California's orchard industries, coinciding with accelerated growth in local drying and canning industries. The development of these specialized crops gave California an economic buffer when wheat prices declined in the early 20$^{th}$ century.

Large-scale commercial operations began to capitalize on mechanical innovations just as irrigation developed in the early 1880s. Consequently, competing economic interests caused land prices to increase and make family farming a less profitable enterprise. Following the world wars, large companies followed their employees to suburban areas east of San Francisco. The establishment of large population centers fostered the development of equally large shopping centers. To meet demand on infrastructure, the State modernized highways and roadways. With the establishment of the Bay Area Rapid Transit system, the central county cities turned to spawn their own suburbs. The once outlying rural areas of Antioch, Oakley, and Brentwood continue to grow.

### 2.3.4 - City of Pleasanton

The City of Pleasanton transformed from a small stopover on the way to gold country in the early 1800s into a city of suburban character dominated by detached single-family homes. Since the 1980s, the City has been heavily redeveloped into a suburban community that lies along the Interstate 580 corridor in eastern Alameda County.

Pleasanton is located in the area east of the Bay Area and south of the Interstate 580. Pleasanton is approximately 25 miles east of Oakland, 5 miles north of Fremont, and 6 miles west of Livermore. Interstate 580 form the northern border of the City. The interstate is the main highway between the cities of Pleasanton and Livermore and also is the main route leading into the cities of Oakland and San Francisco. In addition, Interstate 680 is located approximately .75 miles to the west. Major arterial roads include Sunol Boulevard, which lies to the east of Interstate 680, and Alisal Street, which runs in a north-south direction along the project site.

The City's history first started when José Amador created the first settlement in 1826. The City's modern history stems from the transcontinental railroad in 1869, which accelerated population growth and rapidly increased the economy. Pleasanton was incorporated in 1894 and by 1900 became a prosperous community. The City's Main Street became a center for business and offered

the community a bank and several hotels. In 1930, Henry J. Kaiser created the hugely profitable gravel industry by realizing the potential of sand and gravel below the Amador Valley. However, by 1979 much of Pleasanton was redeveloped into homes, schools, and urban land uses. In 1982, the Hacienda Business Park kickstarted corporate company growth and changed the City. Currently, Pleasanton is home to multinational corporations such as Oracle and is a small bedroom community (Pleasanton Chamber of Commerce 2010).

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# SECTION 3: RESULTS

## 3.1 - Records Search

### 3.1.1 - Northwest Information Center Search

February 15, 2018 FCS staff conducted a records search for the project area and a 0.5-mile radius beyond the project boundaries at the NWIC located at California State University Sonoma. To identify any historic properties or resources, the current inventories of the NR, the CR, the California Historical Landmarks list, the California Points of Historical Interest list, and the California State Historic Resources Inventory were reviewed to determine the existence of previously documented local historical resources. Results from the NWIC indicate that four resources have been recorded within 0.5 mile of the project area (Table 1). In addition, seven area-specific survey reports are on file with the NWIC for the search radius (Table 2). The previous surveys assessed the majority of the project location, suggesting the project area has largely been previously surveyed for cultural resources.

**Table 1: Cultural Resources within a 0.5-mile Radius of the Project Area**

| Resource No. | Resource Description | Date Recorded |
|---|---|---|
| P-01-000044 | **CA-ALA-000024: Prehistoric Site**<br>AP15 (Habitation) | 1950 |
| P-01-002157 | **878 Sycamore Road, House No. 1: Historic Building Site**<br>AH15 (House) | 1997 |
| P-01-002158 | **878 Sycamore Road, House No. 2: Historic Building Site**<br>AH15 (House) | 1997 |
| P-01-010573 | **Manning Barn: Historic Building**<br>HP33 (Farm/Ranch) | 2002 |
| Source: NWIC Records Search, February 15, 2018 | | |

**Table 2: Previous Investigations within a 0.5-mile Radius of the Project Area**

| Report Number | Report Title/Project Focus | Author | Date |
|---|---|---|---|
| S-008838 | Preliminary Cultural Resources Study for the Proposed Vineyard Substation and 230 kV Transmission Line Tap | John Holson | 1985 |
| S-011746 | Archaeological Field Inspection of the Proposed North Sycamore Specific Plan Area, Pleasanton, Alameda County, California (letter report) | Holman and Associates | 1990 |
| S-020727 | A Historical Resources Evaluation of 878 Sycamore Road (Parcel 18 of the North Sycamore Specific Plan Area), Pleasanton, Alameda County, California | William Roop | 1997 |

**Table 2 (cont.): Previous Investigations within a 0.5-mile Radius of the Project Area**

| Report Number | Report Title/Project Focus | Author | Date |
|---|---|---|---|
| S-020809 | Cultural Resources Assessment Report, Happy Valley Project Area, Pleasanton, Alameda County, California | Lori Harrington and Carrie D. Wills | 1998 |
| S-022867 | A Cultural Resources Evaluation of the Lund Ranch II Project, Pleasanton, California | Eric Strother and Amy McCarthy | 1999 |
| S-026576 | Manning Barn Documentation Alameda County, California | William Self Associates | 2002 |
| S-046680 | Archaeological Reconnaissance of the Spotorno Property project area in the City of Pleasanton, Alameda County, California | Matthew R. Clark | 2015 |
| Source: NWIC Records Search, February 15, 2018 | | | |

### 3.1.2 - Native American Heritage Commission and Tribal Correspondence

On January 30, 2018, FCS sent a letter to the NAHC in an effort to determine whether any sacred sites are listed on its Sacred Lands File for the project area. A response was received on March 1, 2018 indicating that the Sacred Lands File failed to indicate the presence of Native American cultural resources in the immediate project area. The NAHC included a list of six tribal representatives available for consultation. To ensure that all Native American knowledge and concerns over potential TCRs that may be affected by the project are addressed, a letter containing project information and requesting any additional information was sent to each tribal representative on March 6, 2018. No responses have been received to date.

## 3.2 - Pedestrian Survey

The project site is located within the USGS Livermore and Dublin 7.5 minute Quadrangle Map Township 3 South, Range 1 East Section 28 Latitude is 37°40’21”N 121°52’57”W. The 154-acre project site is located adjacent to Alisal Street and near 6656 Alisalt Street, Pleasanton, in the City of Pleasanton, Alameda County, California. The project site consists of two parcels designated by APNs 940-0016-006 and 948-015-002-01.

A previous archeological survey of the Spotorno property (S-046680) was conducted in 2015 by Matthew Clark as part of a previous EIR proposed by Michael O’Hara of Tim Lewis Communities in San Ramon. A general surface reconnaissance was conducted by two archeologists and covered the approximately 31-acre flat area where proposed development would occur for the current Spotorno Ranch project. The survey covered north/south transects approximately 15 to 20 meters apart. The recently plowed flatter fields afforded good to poor surface visibility; however, the area east of the flatter areas offered very poor to nonexistent surface visibility due to very thick annual grasses and other vegetation. No evidence of prehistoric cultural use or archeological resources was found on the Spotorno Property project area by surface survey, nor are any recorded on this previously surveyed parcel.

On March 7, 2018, FCS Senior Archaeologist Dana DePietro conducted an updated pedestrian survey for additional unrecorded cultural resources. The survey focused on the proposed development area in the west of the project boundary, and did not include large portions of the eastern project area upon which no development is planned. The survey began in the southwest corner of the project site and moved east, using North-South transects spaced at 15-meter intervals whenever possible. As noted in the previous survey, the project area has been subject to disking and other ground disturbance associated with agricultural activity at the site. Soil visibility was relatively poor across the site, ranging from 15 to 30 percent, due to grasses and ground cover. Soils in sections of poor visibility were intermittently inspected using a hand trowel. Observed soils were largely composed of dark brown silty soil with high clay content, interspersed with small (2- to 3-centimeter) stones primarily composed of quartz, schist, and basalt. Soils in the west of the project area were noticeably darker in color; however, upon close inspection at multiple locations, did not contain artifacts or materials consistent with midden soils.

Survey conditions were documented using digital photographs and field notes. During the survey, Dr. DePietro examined all areas of the exposed ground surface for prehistoric artifacts (e.g., fire-affected rock, milling tools, flaked stone tools, tool-making debris, ceramics), soil discoloration and depressions that might indicate the presence of a cultural midden, faunal and human osteological remains, and features indicative of the former presence of structures or buildings (e.g., postholes, standing exterior walls, foundations) or historic debris (e.g., glass, metal, ceramics). Particular attention was paid to the southeast of the project area, as it is the closest creek running parallel to Happy Valley Road. Water and natural resources are traditionally considered to have higher potential for cultural sensitivity as they were attractive locations for prehistoric human settlement, such as CA-ALA-00024, a known habitation site located to the southwest of the project area.

All areas of proposed development were closely inspected for culturally modified soils or other indicators of potential historic or prehistoric resources. No historic or prehistoric cultural resources or raw materials commonly used in the manufacture of tools (e.g., obsidian, Franciscan chert) were found in these areas.

## 3.3 - Paleontological Records Search

On February 23, 2018, consulting paleontologist Dr. Ken Finger performed a records search on the UCMP database for Spotorno Ranch project site in Alameda County. According to the of the geologic maps by Graymer et al. (2006), the Spotorno Ranch project site is located mostly on the Pleistocene alluvium (Qpa), early Pleistocene and/or Pliocene sediments (QTs), and Miocene sedimentary rocks (Tms). All three of these units have the potential to yield significant paleontological resources. The half-mile search area (dashed red outline) also includes Holocene alluvium (Qha), which is too young to be fossiliferous. Slightly farther to the west are Cretaceous sediments of the Great Valley Complex

The UCMP database lists 64 Pleistocene vertebrate fossil localities (58 Rancholabrean, 6 Irvingtonian) in Alameda County, which have yielded a total of 1,071 specimens (see attached faunal list). Many of these specimens have been described and figured in professional publications. For Alameda County, the University of California Museum of Paleontology database lists 64 Pleistocene vertebrate localities. Two of the QTl localities yielded a composite Irvingtonian (early to middle

Pleistocene) assemblage of mammoth (*Mammuthus*), horse (*Equus*), ground sloths (*Pilosa*), rabbit (*Lepus*), and pond turtle (*Clemmys*), whereas the third yielded a *Mammuthus* of Rancholabrean age (late Pleistocene). The 5 Qa localities yielded bison (*bison antiquus* [extinct bison]), *Equus*, mastodon (*Mammut*), and ground sloth (*Glossotherium*). Another seven Pleistocene vertebrate localities are in the east-adjacent Altamont quadrangle. They yielded elements of the Rancholabrean fauna, including Columbian mammoth (Mammuthus columbi) and Harlan's ground sloth (Glossotherium harlani). For Alameda County, the UCMP database also lists two specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch. A copy of Dr. Finger's report may be found in Appendix D.

# SECTION 4: SUMMARY AND RECOMMENDATIONS

## 4.1 - Summary

In accordance with CEQA regulations, FCS assessed the effects of development for the proposed project site. Results from the NWIC indicate that one prehistoric and three historic-era resources are have been recorded within 0.5 mile of the project area. In addition, seven area-specific survey reports are on file with the NWIC for the search radius. One previous survey (S-046680) assessed the project location in its entirety with negative results, which were confirmed by a second pedestrian survey conducted by FCS in March of 2018. The results of the NAHC Sacred Lands File search failed to identify potential TCRs that may be adversely affected by the proposed project. To ensure that all Native American knowledge and concerns over potential TCRs that may be affected by the project are addressed, a letter containing project information and requesting any additional information was sent to each tribal representative on March 6, 2018. No responses have been received to date.

The paleontological report identified the site as consisting of Miocene, Pleistocene, and Pliocene units that have the potential to yield significant paleontological resources. The UCMP database lists 64 Pleistocene vertebrate localities and 1,071 vertebrate specimens. In addition, UCMP database also lists two specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch.

## 4.2 - Recommendations

### 4.2.1 - Cultural and Paleontological Resource Recommendations

Based on the results of the records searches, Native American correspondence, and pedestrian survey, FCS considers the potential for the project to have an adverse effect on historic or prehistoric cultural resources to be moderate. Four resources have been recorded within a 0.5-mile radius of the project site, one of which (CA-ALA-00024) appears to be a potentially significant prehistoric resources. No additional resources were observed within the site boundaries over the course of the pedestrian survey; however, poor soil visibility and close proximity to natural resources and a known prehistoric settlement increases the potential for undiscovered resources to be present within the site boundaries. FCS therefore recommends that a qualified archaeologist who meets the Secretary of Interior's Professional Qualification Standards for archaeology be present during the initial phase of ground disturbance and grading in order to check for the inadvertent exposure of cultural materials. This may be followed by regular periodic or "spot-check" archaeological monitoring as needed, but full-time archaeological monitoring is not recommended at this time.

Hundreds of vertebrate fossils have been collected in Alameda County from Pleistocene alluvium and Miocene marine deposits; hence, both are ranked as highly sensitive for significant paleontological resources. Those fossil occurrences in alluvium are usually unpredictable, however, because they tend to be scattered due to their post-mortem stream or floodwater transport and deposition. A pre-construction paleontological walkover of Spotorno Ranch is not recommended because the surface of the site is disturbed. Paleontological monitoring of project-related excavations is

recommended because of the moderate to high sensitivity of the geological units. Should any significant paleontological resource (i.e., teeth or bones) be encountered, the construction crew should not attempt to remove them, which is likely to result in loss of data or specimen damage. Instead, construction activities should be diverted from the find until a professional paleontologist has evaluated it and, if confirmed as significant, properly recorded and salvaged it. Recovered fossils should then be deposited in an accredited and permanent scientific institution (e.g., UCMP) where they will be properly curated and preserved for the benefit of current and future generations.

Additional procedures for the inadvertent discoveries of human remains and cultural resources are provided below.

## 4.3 - Inadvertent Discovery Procedures

### 4.3.1 - Accidental Discovery of Cultural Resources

It is always possible that ground-disturbing activities during construction may uncover previously unknown, buried cultural resources. In the event that buried cultural resources are discovered during construction, operations shall stop in the immediate vicinity of the find and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archeologist and shall make recommendations to the Lead Agency on the measures that shall be implemented to protect the discovered resources, including but not limited to excavation of the finds and evaluation of the finds in accordance with Section 15064.5 of the CEQA Guidelines. Potentially significant cultural resources consist of but are not limited to stone, bone, fossils, wood, or shell artifacts or features, including hearths, structural remains, or historic dumpsites. Any previously undiscovered resources found during construction within the project area should be recorded on appropriate DPR forms and evaluated for significance in terms of CEQA criteria.

If the resources are determined to be unique historic resources as defined under Section 15064.5 of the CEQA Guidelines, mitigation measures shall be identified by the monitor and recommended to the Lead Agency. Appropriate mitigation measures for significant resources could include avoidance or capping, incorporation of the site in green space, parks, or open space, or data recovery excavations of the finds.

No further grading shall occur in the area of the discovery until the Lead Agency approves the measures to protect these resources. Any archaeological artifacts recovered as a result of mitigation shall be donated to a qualified scientific institution approved by the Lead Agency where they would be afforded long-term preservation to allow future scientific study.

### 4.3.2 - Accidental Discovery of Human Remains

There is always the possibility that ground-disturbing activities during construction may uncover previously unknown, buried human remains. Should this occur, Section 7050.5 of the California Health and Safety Code applies, and the following procedures shall be followed.

In the event of an accidental discovery or recognition of any human remains, Public Resource Code (PRC) Section 5097.98 must be followed. In this instance, once project-related earthmoving begins and if there is accidental discovery or recognition of any human remains, the following steps shall be taken:

1. There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until the County Coroner is contacted to determine if the remains are Native American and if an investigation of the cause of death is required. If the coroner determines the remains to be Native American, the coroner shall contact the NAHC within 24 hours, and the NAHC shall identify the person or persons it believes to be the "most likely descendant" of the deceased Native American. The most likely descendant may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in PRC Section 5097.98, or

2. Where the following conditions occur, the landowner or his/her authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity either in accordance with the recommendations of the most likely descendent or on the project area in a location not subject to further subsurface disturbance:
   - The NAHC is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 48 hours after being notified by the commission;
   - The descendent identified fails to make a recommendation; or
   - The landowner or his authorized representative rejects the recommendation of the descendent, and the mediation by the NAHC fails to provide measures acceptable to the landowner.

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# SECTION 5: REFERENCES

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# Appendix A: Pedestrian Survey Photographs

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Photograph 1: Overview of the project development area; facing north.

Photograph 2: Overview of the project development area; facing east.

Photograph 3: Overview of the project development area; facing south.

Photograph 4: Overview of the project development area; facing west.

Photograph 5: View of eastern project area not slated for development; facing east.

Photograph 6: Detail of representative soil composition in the east of the project development area.

Photograph 7: Detail of representative soil composition in the center of the project development area.

Photograph 8: Detail of representative soil composition in the east of the project development area.

# Appendix B: Native American Heritage Commission Search Request/ Results and Native American Correspondence

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# Local Government Tribal Consultation List Request

**Native American Heritage Commission**
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471 – Fax
nahc@nahc.ca.gov

**Type of List Requested**

☑ **CEQA Tribal Consultation List (AB 52)** – ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18)** - ***Per Government Code § 65352.3.***

**Local Action Type:**

___ **General Plan** ___ **General Plan Element** ___ **General Plan Amendment**

___ **Specific Plan** ___ **Specific Plan Amendment** ___ **Pre-planning Outreach Activity**

**Required Information**

**Project Title:** 2148.0015 Spotorno Ranch

**Local Government/Lead Agency:** City of Pleasanton

**Contact Person:** Dr. Dana DePietro

**Street Address:** 1350 Treat Boulevard, Ste. 380

**City:** Walnut Creek **Zip:** 94597

**Phone:** 530-219-1432 **Fax:**

**Email:** ddepietro@fcs-intl.com

**Specific Area Subject to Proposed Action**

**County:** Alameda **City/Community:** Pleasanton

**Project Description:**

The project site is located in the southern portion of the City of Pleasanton, Alameda County, California. The site is bounded by Alisal Street on the west, Westbridge Lane to the south and undeveloped hills to the east. The topography of the site is varied, with hills and ridgelines in the northern and eastern portions of the site (Spotorno Hill) and flat terrain in the west (Spotorno Flat). Site consists of mostly undeveloped land and is enclosed with a barbed-wire fence. The Project would consist of the development of 39 single-family residents on approximately 30-acres and permanently preserve approximately 124-acres as open space. Lot sizes would range between 22,024 and 38,311 square feet, for an average lot size of 27,394 square feet. The minimum depth of excavation for each home site would be 140 feet. Each home site would have a minimum front yard setback of 35 feet, with a side yard setback of 25 feet and a rear setback of 35 feet. A 2.01-acre undeveloped parcel in the western portion of the site that contains wetlands would be preserved. The project would include a bio-retention pond located within the west corner of the project site.

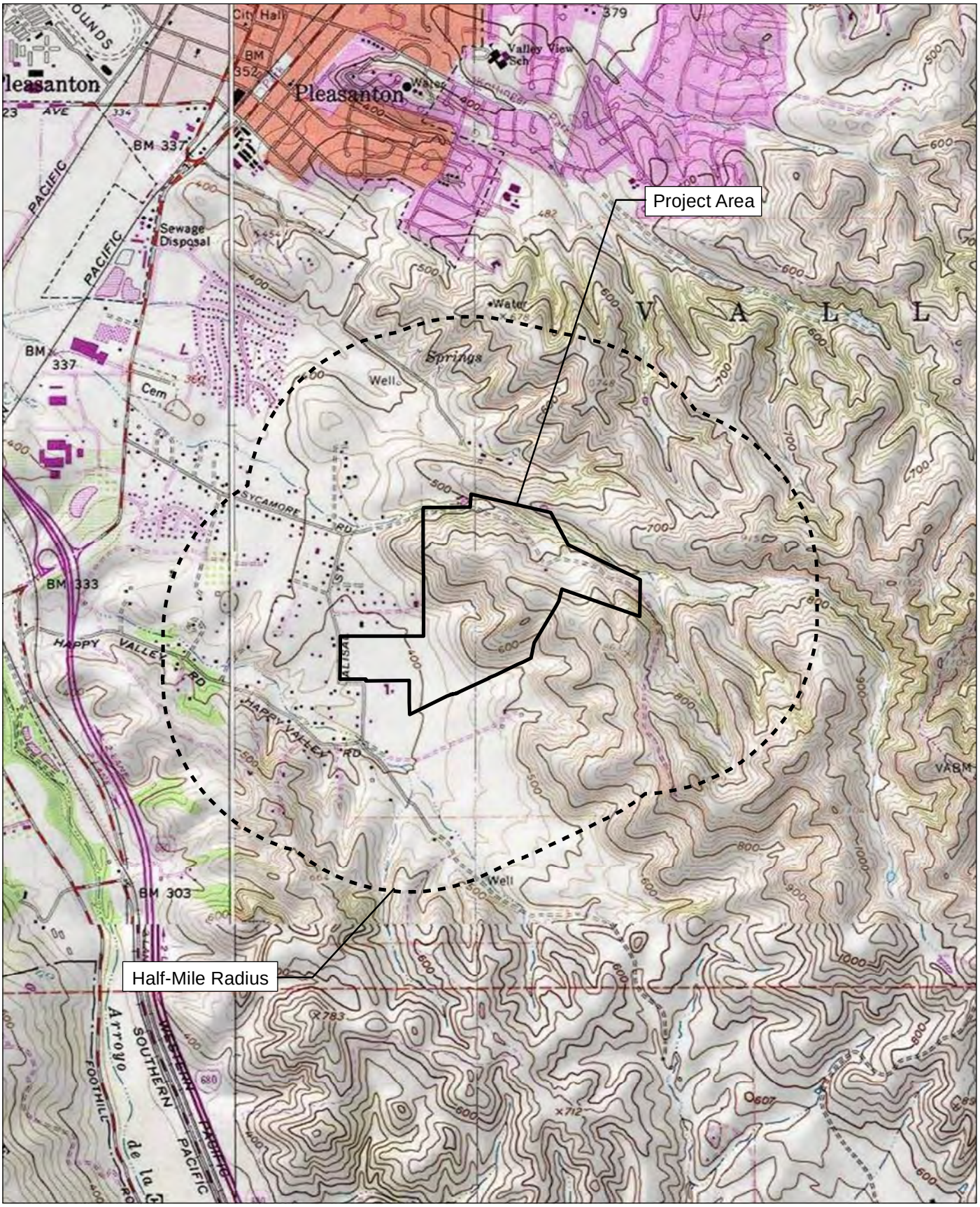
**Additional Request**

☑ **Sacred Lands File Search** - ***Required Information:***

**USGS Quadrangle Name(s):** Livermore and Dublin

**Township:** 3S **Range:** 1E

**Section(s):** 28




Source: USGS Livermore and dublin 7.5' Quadrangles / T3S,R1E,sec28

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2,000 1,000 0 2,000 Feet

# Record Search Map

STATE OF CALIFORNIA Edmund G. Brown, Jr., Governor

**NATIVE AMERICAN HERITAGE COMMISSION**
**Environmental and Cultural Department**
**1550 Harbor Blvd., ROOM 100**
**West SACRAMENTO, CA 95691**
**(916) 373-3710**
**Fax (916) 373-5471**

March 1, 2018

Dana DePietro
FCS

Sent by Email: ddepietro@fcs-intl.com

Re: 2148.0015 Spotorno Ranch, Alameda County

Dear Mr. DePietro,

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results indicate Native American cultural sites are present. Please contact the Muwekma Ohlone Indian Tribe. Other sources for cultural resources should also be contacted for information regarding known and/or recorded sites.

Enclosed is a list of Native American tribes who may also have knowledge of cultural resources in the project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these tribes, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at frank.lienert@nahc.ca.gov.

Sincerely,

Frank Lienert
Associate Governmental Program Analyst

**Native American Heritage Commission**
**Tribal Consultation List**
**March 1, 2018**

Coastanoan Rumsen Carmel Tribe
Tony Cerda, Chairperson
244 E. 1st Street
Pomona , CA 91766
rumsen@aol.com
(909) 524-8041 Cell

Ohlone/Costanoan

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister , CA 95024
ams@indiancanyon.org
(831) 637-4238

Ohlone/Costanoan

Amah MutsunTribal Band of Mission San Juan Bautista
Irenne Zwierlein, Chairperson
789 Canada Road
Woodside , CA 94062
amahmutsuntribal@gmail.com
(650) 851-7489 Cell
(650) 851-7747 Office

Ohlone/Costanoan

North Valley Yokuts Tribe
Katherine Erolinda Perez, Chairperson
P.O. Box 717
Linden , CA 95236
canutes@verizon.net
(209) 887-3415

Ohlone/Costanoan
Northern Valley Yokuts
Bay Miwok

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
P.O. Box 360791
Milpitas , CA 95036
muwekma@muwekma.org
(408) 314-1898

Ohlone / Costanoan

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont , CA 94539
chochenyo@AOL.com
(510) 882-0527 Cell

Ohlone/Costanoan
Bay Miwok
Plains Miwok
Patwin

**This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097 .94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.**

**This list is applicable only for consultation with Native American tribes under Government Code Sections 65352.3, 65362.4 et seq. and Public Resourc es 2148.0015 Spotorno Ranch, Alameda County**

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Cover Letter

March 6, 2018

Muwekma Ohlone Indian Tribe of the SF Bay Area
Rosemary Cambra, Chairperson
P.O. Box 360791
Milpitas, CA 95036

**Subject: Proposed Spotorno Ranch EIR**

Dear Chairperson Cambra,

FirstCarbon Solutions (FCS) is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project on behalf of the City of Pleasanton. As part of the environmental review process, we are conducting a cultural resources assessment.

The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

As part of the cultural resources assessment, FCS conducted a Sacred Lands File search and a California Historical Resources Information System (CHRIS) search, neither of which produced results. FCS contacted the Native American Heritage Commission (NAHC), and they suggested you might be able to provide further information. If you have any additional information regarding potential historic or cultural resources in proximity or relation to the proposed project area, we would greatly appreciate your input.


**UNITED STATES**

Irvine
250 Commerce, Suite 250
Irvine, CA 92602

Pasadena
16 N. Marengo Avenue, Suite 303
Pasadena, CA 91101

Bay Area
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

Central Valley
7265 N First Street, Suite 101
Fresno, CA 93720

Inland Empire
650 E. Hospitality Lane, Suite 125
San Bernardino, CA 92408

Sacramento Valley
2204 Plaza Drive, Suite 210
Rocklin, CA 95765

Connecticut
2 Corporate Drive
Suite 450
Shelton, CT 06484

**EUROPE**

United Kingdom
Tel: +44 (0) 845.165.6245
Fax: +44 (0) 20.3070.0890
Jubilee House
Third Avenue
Marlow
United Kingdom SL7 1EY

**AUSTRALIA**

New South Wales
Tel: +61 (02) 9418.7822
Unit 1, 1 Skyline Place
Frenchs Forest NSW 2086
Australia

**AFRICA**

Kenya
Tel: +254-737-433-621
ADEC Kenya Services EPZ Ltd.
Nairobi, Kenya

**ASIA**

Philippines
Tel: +63 (2) 775.0632
Fax: +63 (2) 775.0632 local 8050
26th Floor, Philippine AXA Life Centre,
Sen. Gil Puyat Avenue,
Makati City, Metro Manila

Malaysia
Tel: +603 74902112
Fax: +603 79606977
15-7, Block A, Jaya ONE
72A Jalan Universiti
46200 Petaling Jaya
Selangor, Malaysia

Please note that this letter is a request for information pertaining to a cultural resources assessment and is not notification of a project under Senate Bill (SB) 18, Assembly Bill (AB) 52 or Section 106 of the National Historic Preservation Act. Project notification and consultation requirements are being handled by designated lead agencies under CEQA and NEPA. Please feel free to contact me at 925.357.2562 or via email at ddepietro@fcs-intl.com and thank you for your valuable assistance.

Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

Enc: Attachment A: Project Location Map for Spotorno Ranch Project

**UNITED STATES**

Irvine
250 Commerce, Suite 250
Irvine, CA 92602

Pasadena
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Pasadena, CA 91101

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2 Corporate Drive
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Jubilee House
Third Avenue
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United Kingdom SL7 1EY

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New South Wales
Tel: +61 (02) 9418.7822
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26th Floor, Philippine AXA Life Centre,
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Malaysia
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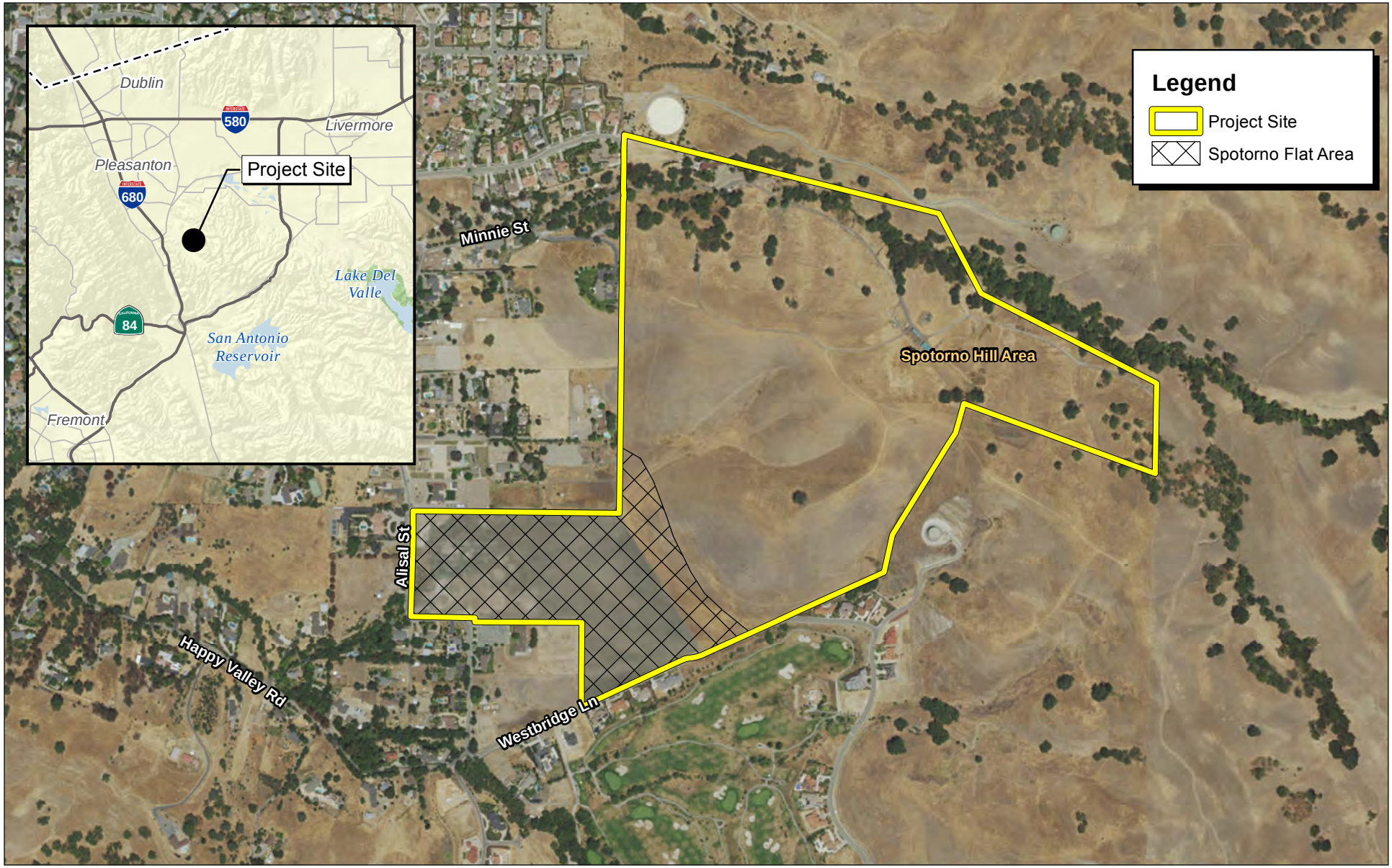
15-7, Block A, Jaya ONE
72A Jalan Universiti
46200 Petaling Jaya
Selangor, Malaysia




Source: ESRI Imagery, Ruggeri, Jensen, Azar, 2015

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Exhibit 1
Project Location

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CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

FIRSTCARBON SOLUTIONS™

Cover Letter

March 6, 2018

Coastanoan Rumsen Carmel Tribe
Tony Cerda, Chairperson
244 E. 1st Street
Pomona, CA 91766

**Subject: Proposed Spotorno Ranch EIR**

Dear Chairperson Cerda,

FirstCarbon Solutions (FCS) is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project on behalf of the City of Pleasanton. As part of the environmental review process, we are conducting a cultural resources assessment.

The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

As part of the cultural resources assessment, FCS conducted a Sacred Lands File search and a California Historical Resources Information System (CHRIS) search, neither of which produced results. FCS contacted the Native American Heritage Commission (NAHC), and they suggested you might be able to provide further information. If you have any additional information regarding potential historic or cultural resources in proximity or relation to the proposed project area, we would greatly appreciate your input.


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Fax: +603 79606977
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46200 Petaling Jaya
Selangor, Malaysia

**Please note that this letter is a request for information pertaining to a cultural resources assessment and is not notification of a project under Senate Bill (SB) 18, Assembly Bill (AB) 52 or Section 106 of the National Historic Preservation Act.** Project notification and consultation requirements are being handled by designated lead agencies under CEQA and NEPA. Please feel free to contact me at 925.357.2562 or via email at ddepietro@fcs-intl.com and thank you for your valuable assistance.

Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
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Nairobi, Kenya

**ASIA**

Philippines
Tel: +63 (2) 775.0632
Fax: +63 (2) 775.0632 local 8050
26th Floor, Philippine AXA Life Centre,
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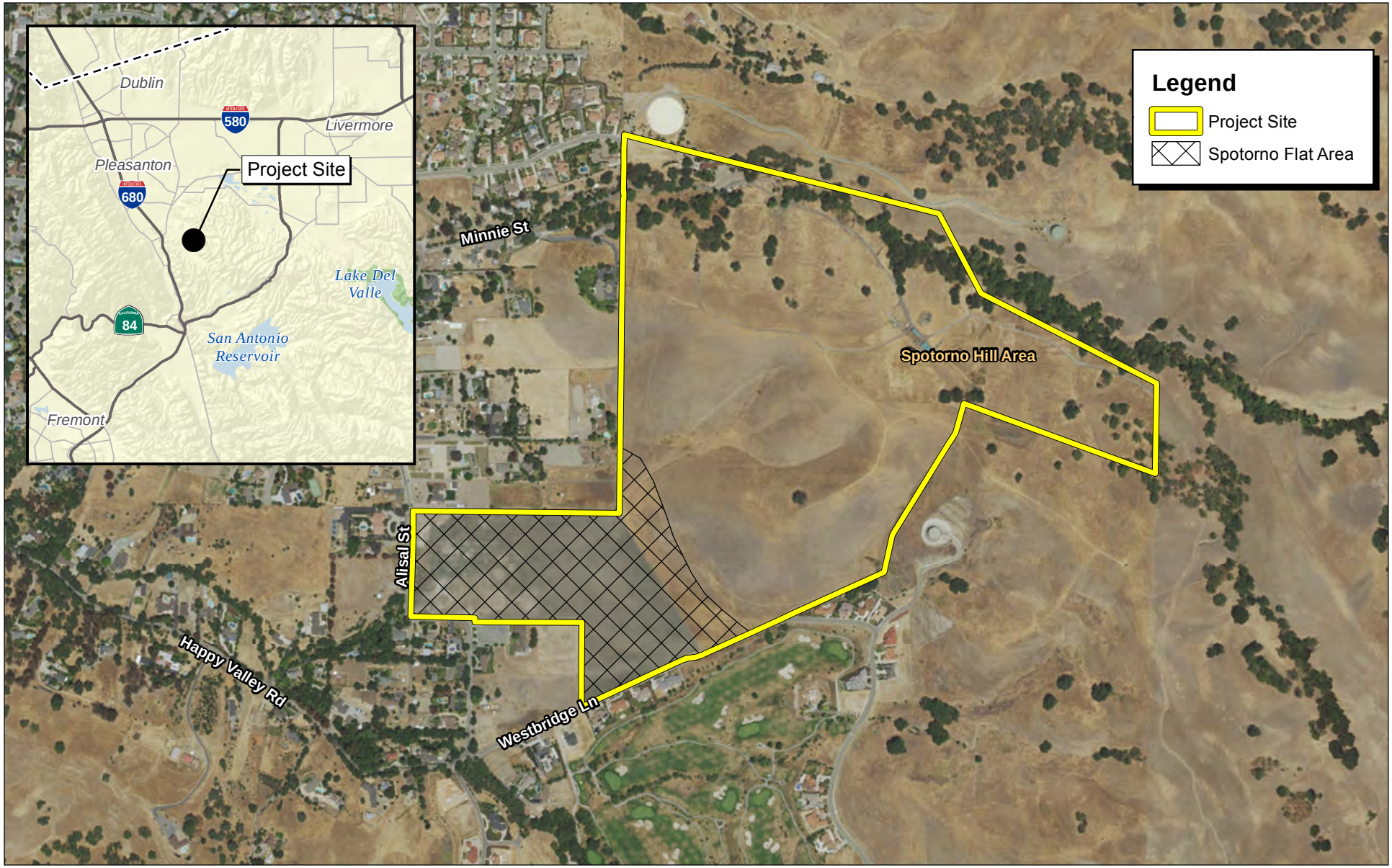


Source: ESRI Imagery, Ruggeri, Jensen, Azar, 2015

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850 425 0 850 Feet

Exhibit 1
Project Location

21480015 • 02/2017 | 1_location.mxd

CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

FIRSTCARBON SOLUTIONS™

Cover Letter

March 6, 2018

The Ohlone Indian Tribe
Andrew Galvan
P.O. Box 3152
Fremont, CA 94539

**Subject: Proposed Spotorno Ranch EIR**

Dear Andrew Galvan,

FirstCarbon Solutions (FCS) is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project on behalf of the City of Pleasanton. As part of the environmental review process, we are conducting a cultural resources assessment.

The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

As part of the cultural resources assessment, FCS conducted a Sacred Lands File search and a California Historical Resources Information System (CHRIS) search, neither of which produced results. FCS contacted the Native American Heritage Commission (NAHC), and they suggested you might be able to provide further information. If you have any additional information regarding potential historic or cultural resources in proximity or relation to the proposed project area, we would greatly appreciate your input.


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United Kingdom
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Jubilee House
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**AUSTRALIA**

New South Wales
Tel: +61 (02) 9418.7822
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Frenchs Forest NSW 2086
Australia

**AFRICA**

Kenya
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Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

Enc: Attachment A: Project Location Map for Spotorno Ranch Project

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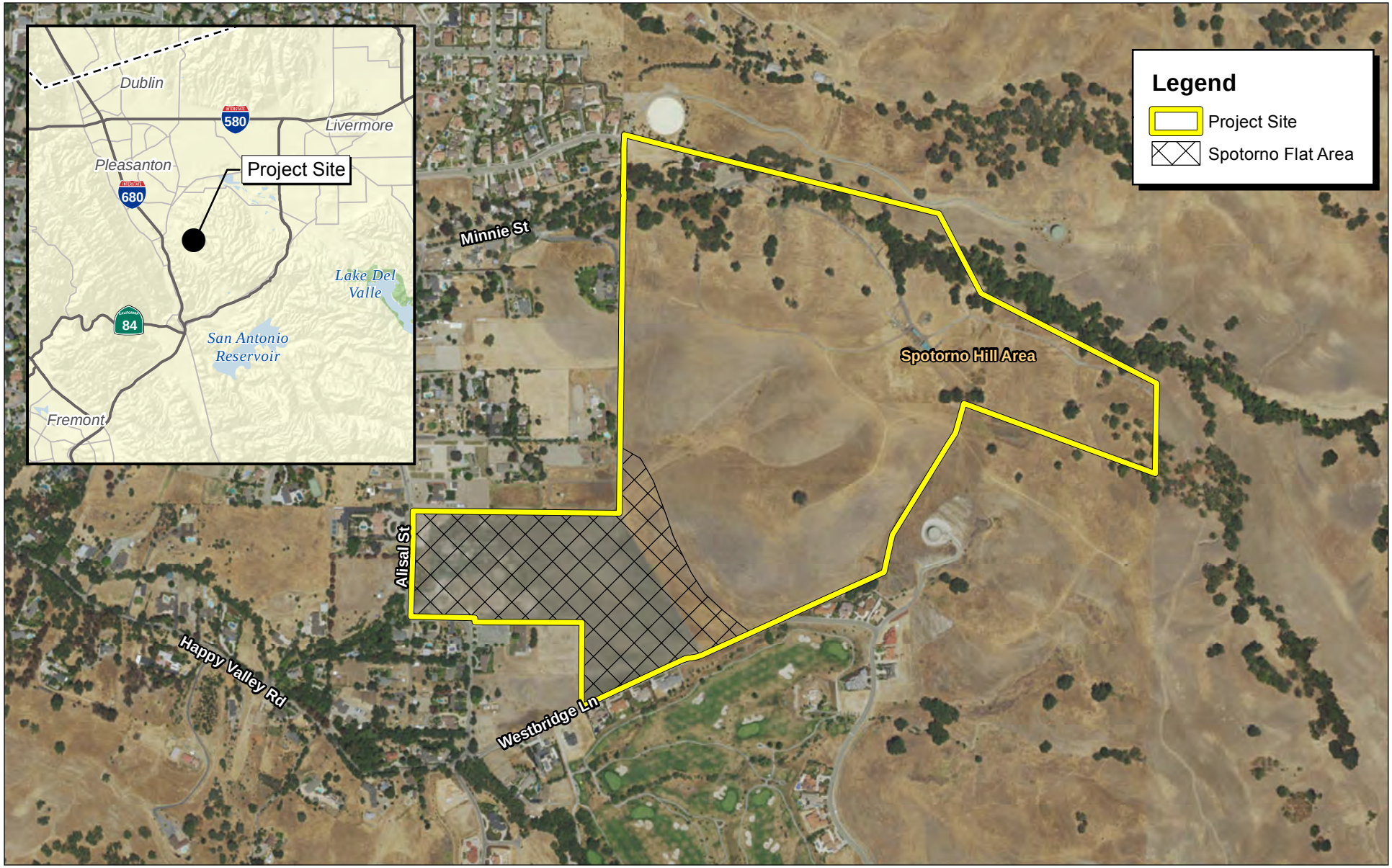


Source: ESRI Imagery, Ruggeri, Jensen, Azar, 2015

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Exhibit 1
Project Location

21480015 • 02/2017 | 1_location.mxd

CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

FIRSTCARBON SOLUTIONS™

Cover Letter

March 6, 2018

North Valley Yokuts Tribe
Katherine Erolinda Perez, Chairperson
P.O. Box 717
Linden, CA 95236

**Subject: Proposed Spotorno Ranch EIR**

Dear Chairperson Perez,

FirstCarbon Solutions (FCS) is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project on behalf of the City of Pleasanton. As part of the environmental review process, we are conducting a cultural resources assessment.

The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

As part of the cultural resources assessment, FCS conducted a Sacred Lands File search and a California Historical Resources Information System (CHRIS) search, neither of which produced results. FCS contacted the Native American Heritage Commission (NAHC), and they suggested you might be able to provide further information. If you have any additional information regarding potential historic or cultural resources in proximity or relation to the proposed project area, we would greatly appreciate your input.


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Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
1350 Treat Boulevard, Suite 380
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Enc: Attachment A: Project Location Map for Spotorno Ranch Project

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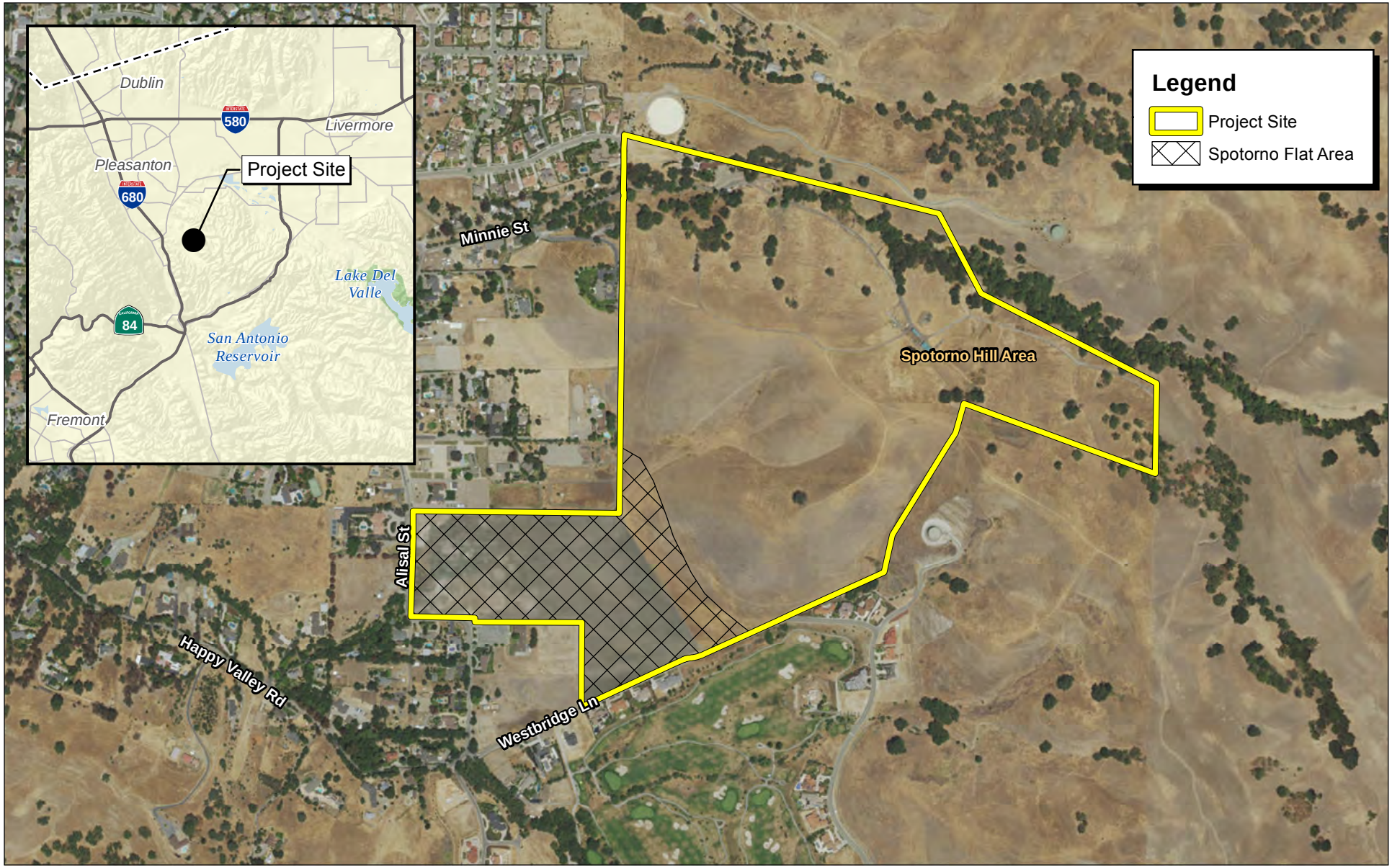


Source: ESRI Imagery, Ruggeri, Jensen, Azar, 2015

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Exhibit 1
Project Location

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CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

FIRSTCARBON SOLUTIONS™

Cover Letter

March 6, 2018

Indian Canyon Mutsun Band of Costanoan
Ann Marie Sayers, Chairperson
P.O. Box 28
Hollister, CA 95024

**Subject: Proposed Spotorno Ranch**

Dear Chairperson Sayers,

FirstCarbon Solutions (FCS) is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Ranch Project on behalf of the City of Pleasanton. As part of the environmental review process, we are conducting a cultural resources assessment.

The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

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Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
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Enc: Attachment A: Project Location Map for Spotorno Ranch Project

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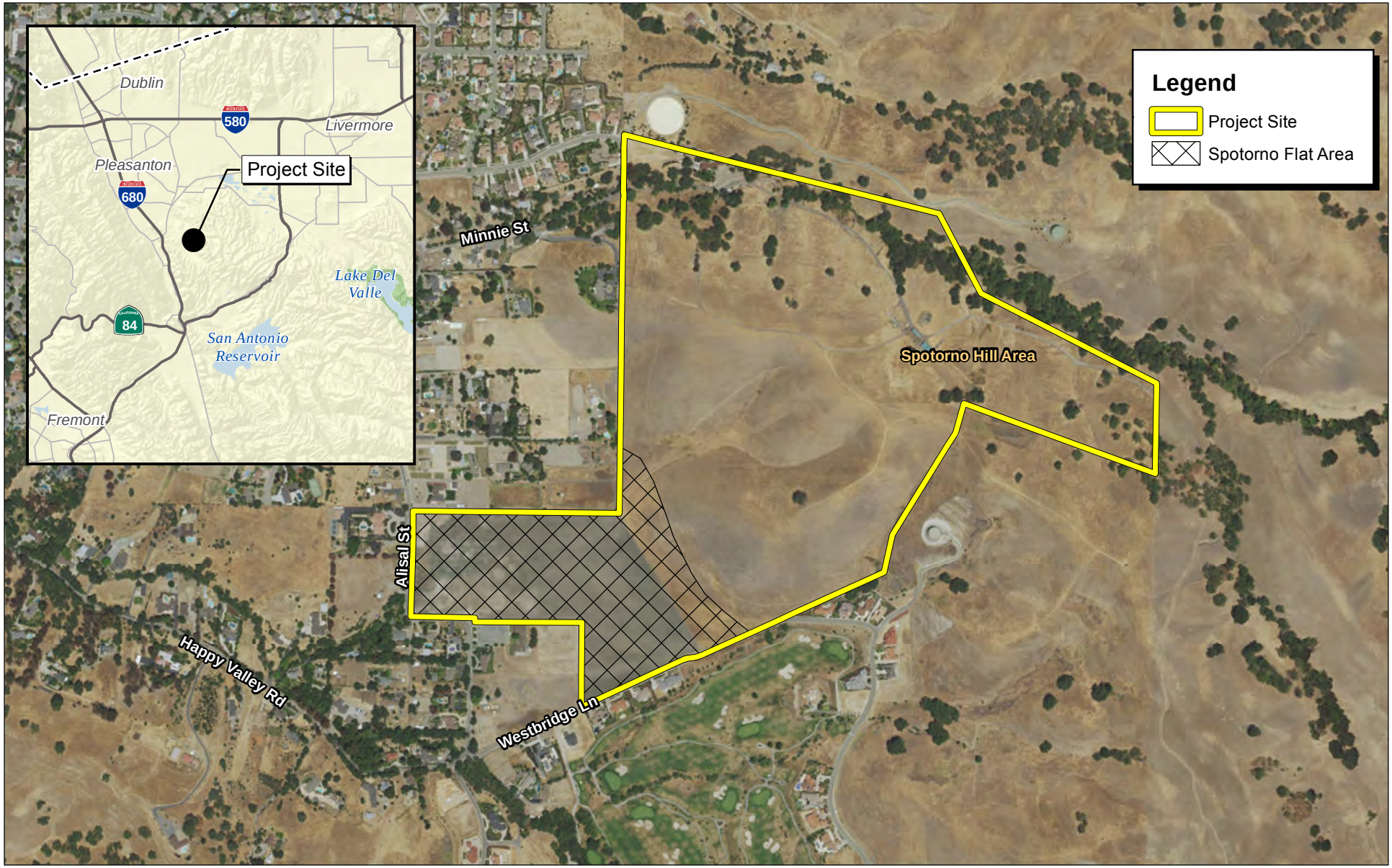


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Exhibit 1
Project Location

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CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

FIRSTCARBON SOLUTIONS™

Cover Letter

March 6, 2018

Amah Mutsun Tribal Band of Mission San Juan Bautista
Irenne Zweirlein, Chairperson
789 Canada Road
Woodside, CA 94062

**Subject: Proposed Spotorno Ranch EIR**

Dear Chairperson Zwierlein,

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The City of Pleasanton is proposing to build 39 homes within a 31-acre lot within the Spotorno Flats area of the Happy Valley Specific Plan, within Assessor's Parcel Numbers (APNs) 940-0016-006 and 948-015-002-01. The project site is mostly undeveloped, and stormwater follows natural drainage patterns, emptying into existing wetlands located within the project site, flowing off-site via existing drainage ditches and ephemeral streams, or percolation into groundwater reservoirs. Six of the lots would include on-site bio-retention for stormwater. The project site consists of mostly undeveloped land. The project site is enclosed with a barbed-wire fence. A gated access point is located near the Faith Chapel of God church. Cattle are grazed on the hilly portion of the site. An approximately 20 foot tall wood windmill that powers an irrigation well to irrigate the property for existing cattle grazing is located within Spotorno Flats. Located in the east portion of the project site, over the crest of the hilly terrain, are three ranching structures and associated paraphernalia. One resident is located in the far northern corner. Access to the property provided via Minnie Road. The project site is dominated by mature vegetation and nonnative and native grasslands. The western portion of the site (approximately 30 acres) contains flat terrain that is mowed and tilled on a regular basis, while the eastern portion of the site (approximately 124 acre) contains hilly terrain with steep slopes. The project would also involve the development of a circulation system (including new trials), roadway improvements, landscaping, bio-retention facilities, and the permanent preservation of approximately 124 acres of open space.

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Sincerely,

Dana Douglas DePietro, Ph.D.
**FirstCarbon Solutions**
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Enc: Attachment A: Project Location Map for Spotorno Ranch Project

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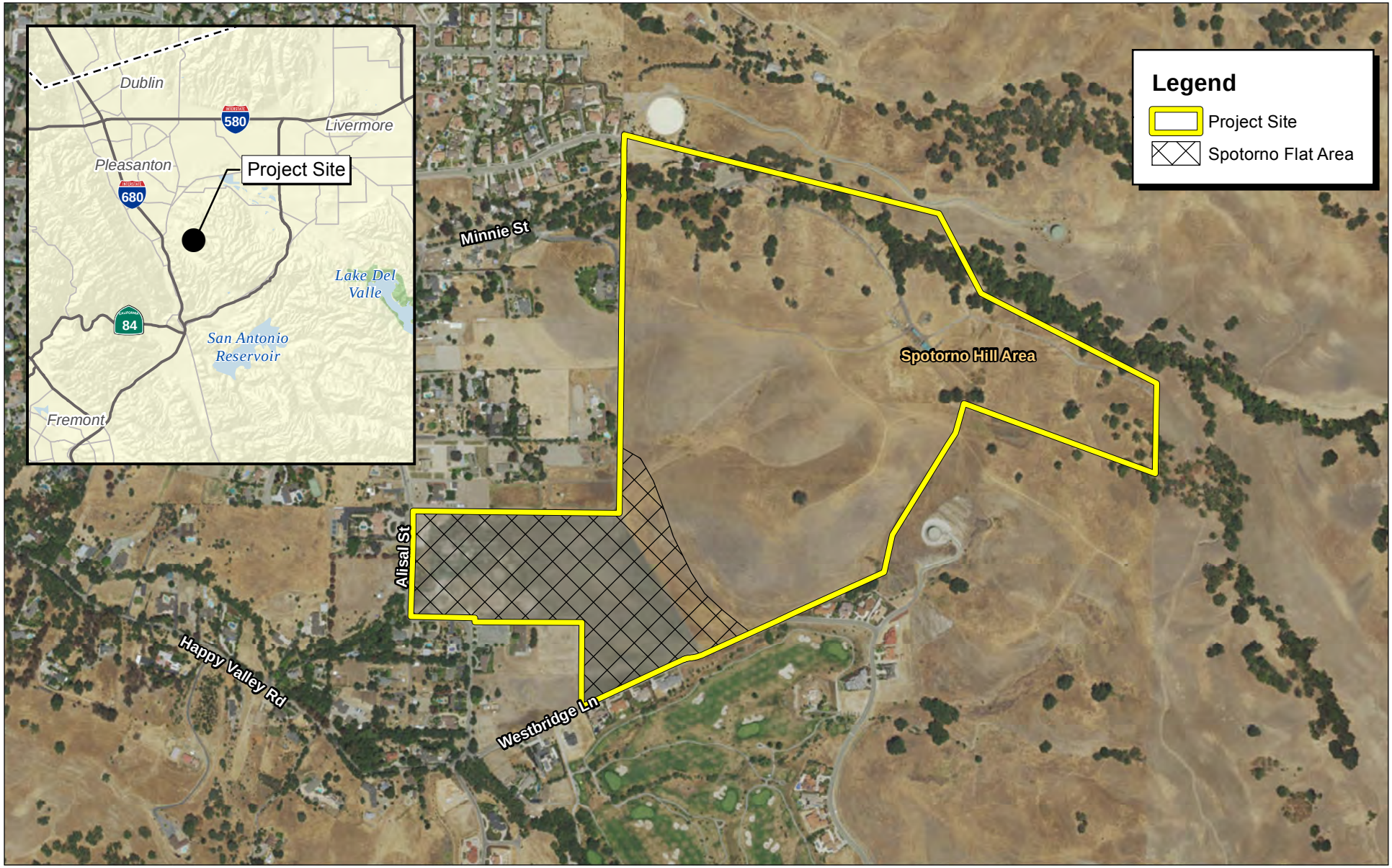


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CITY OF PLEASANTON • SPOTORNO RANCH EIR
NOTICE OF PREPARATION

# Appendix C: Personnel Qualifications

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# DANA DOUGLAS DePIETRO, PH.D.—Cultural Resources Lead (North)

## OVERVIEW

- More than 15 Years' Experience in Archaeology and Cultural Resources

## Education

- Ph.D., Near Eastern Art and Archaeology, University of California at Berkeley, 2012
- M.A., Near Eastern Art and Archaeology, University of California at Berkeley, 2005
- B.A., Archaeology and History (double major), University of California at San Diego, 2002

## Fellowships and Awards

- Albright Institute Educational and Cultural Affairs Fellowship (2015)
- Katherine Davis Foundation Projects for Peace Prize (2012)
- International House Gateway Fellowship (2011-2012)
- The George Franklin Dales Foundation Fellowship for Archaeological Research (2011)
- CAORC Multi-Country Dissertation Research Fellowship (2010)

**Dana DePietro, Ph.D.** is a Registered Professional Archaeologist who meets the Secretary of Interior's standards for historic preservation programs in archaeology. Dr. DePietro has over 15 years of experience in all aspects of cultural resource management, including prehistoric and historic archaeology, paleontology, materials conservation, history of art and architecture, and community engagement. He has experience in compliance with the National Environmental Policy Act (NEPA), the California Environment Quality Act (CEQA), the National Historic Preservation Act (NHPA), and the Archaeological Resources Protection Act (ARAP). Dr. DePietro has completed cultural resource projects that have involved agency, client, Native American, and subcontractor coordination; treatment plans and research design development; archival research; field reconnaissance; site testing; data recovery excavation; construction monitoring; site recordation; site protection/preservation, mapping/ cartography; spatial analysis/GIS; laboratory analysis; materials conservation; artifact curation and exhibition; and report production. He has completed projects in California within the jurisdiction of the Bureau of Land Management (BLM) and other federal agencies requiring compliance with Section 106 of the NHPA. He has also completed projects throughout California under CEQA for state and local governments and municipalities, including the California Department of Transportation (Caltrans) and has worked with clients to insure deliverables meet and exceed the standards set by the State Historic Preservation Office (SHPO).

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## RELATED EXPERIENCE AND CLIENT SUMMARY

### FirstCarbon Solutions

As the Lead Archaeologist/Cultural Resource Specialist for FCS, Dr. DePietro conducts evaluations and performs field documentation of historic and prehistoric cultural resources; prepares environmental impact reports (EIRs), cultural resources assessments (CRAs), DPR forms and Section 106 reports; conducts mapping, GIS analysis, and state and county record searches; leads archaeological surveys and field monitoring efforts; and coordinates with state, federal and tribal officials and institutions for a variety of FCS projects, including the following:

## DANA DOUGLAS DePIETRO, PH.D.—Cultural Resources Lead (North)

- Atherton Baptist Homes Master Plan/Phase II, City of Alhambra, Los Angeles County
- Biological and Cultural Resources Assistance 140-Acre Project Site Woodcrest, Riverside County, CA
- Blanchard Road Industrial EIR Project, City of San Jose, Santa Clara County, CA
- Bonadelle Tract 6120 AQ/GHG and Bio Tech Studies, City of Clovis, Fresno County, CA
- CEQA Analysis for Mayhew Way Project, City of Walnut Creek, Contra Costa County
- 2268 El Camino Real, Mountain View—II CEQA Compliance Checklist Project, City of Mountain View, Santa Clara County
- CEQA Documentation for New Science Building, City of Fairfield, Solano County
- CEQA Services for Clover Spring Open Space Preserve Project, City of Cloverdale, Sonoma County
- Chico Walmart Expansion Project, City of Chico, CA
- Cultural Resources Services for Froom Ranch/El Villagio Specific Plan, City of San Luis Obispo, CA
- Cultural Resource & Historic Evaluation for Sacramento Dome Theatre, City of Sacramento, CA
- Cultural Resources Services for Haven Berryessa Block 7 & 8 San Jose Flea Market, San Jose, CA
- Caltrans NEPA/CEQA Documentation and Permitting for the Dogtown Road Bridges Replacement Projects (San Domingo Creek, French Gulch, and Indian Creek), Calaveras County, CA
- Due Diligence for Meadowlark Project in Pleasanton, CA
- Due Diligence Services for the Montalcino Property, Napa County, CA
- Due Diligence Site Review for Parcel APN 68-241-30 located at 260 Bartlett Way Santa Cruz, CA
- Due Diligence Level IA Entitlements for the Boscell Road Osgood Project, City of Fremont, CA
- Trellis Residential Project EIR, City of Walnut Creek, CA
- El Dorado Materials Recovery Facility Remodeling Project, El Dorado County, CA
- Farmstand IS/MND, City of Healdsburg, CA
- La Paloma Winery Demo Project IS/MND, City of Clovis, CA
- Kaiser Dublin Medical Center EIR, City of Dublin, California
- Merced Gateway Master Plan Project EIR, City of Merced, CA
- Phase 1 Cultural Resource Assessment for 44 acres TTM No. 19992, Rancho Cucamonga, CA
- Bonadelle Tract 6120 Cultural Resources Study, City of Clovis, CA
- Professional Services to Support the Development of a Preferred Development Plan and Associated Regulatory Strategies for the Solano 360 Project, Solano County, CA
- Tassajara Parks EIR, Contra Costa County, California

### Other Relevant Experience

*The Society for Humanitarian Archaeological Research and Exploration*

Dr. DePietro is the Founder and Executive Director of The Society for Humanitarian Archaeological Research and Exploration. He manages the projects, staff, and the daily operation of this not-for-profit organization. Dr. DePietro likewise establishes relationships with partner universities and institutions, writes grant proposals, supervises fundraising projects, and maintains accounts, financial records, and the organization's online presence.

*University of California at Berkeley*

Dr. DePietro was a lecturer at the University of California, Berkeley from August 2003 to January 2015. During his tenure, he prepared University-level source and lectures in the history of the modern and ancient Middle East, performed student advising and evaluation, and university administrative duties. Dr. DePietro provided resources and opportunities that empower people to critically engage with other cultures as well as with their own communities.

## DANA DOUGLAS DePIETRO, PH.D.—Cultural Resources Lead (North)

*Penn State University—Tel Akko Total Archaeology Project*

Dr. DePietro was the Director of Community Engagement from 2013 to 2014 at the Penn State University for the Tel Akko Total Archaeology Project. He developed and executed a community engagement program, supervised staff and community participants, taught excavation and conservation techniques to groups of young people in Akko, and performed outreach, dialogue, and program developments in partnership[ with community leaders.

*Harvard University—Leon Levy Expedition to Ashkelon, Israel*

Dr. De Pietro was the excavation supervisor during the summers of 2007-2013 for the Harvard University—Leon Levy Expedition to Ashkelon, Israel. He supervised the excavation and stratagraphic interpretation and instructed students in excavation techniques, data collection, photography, analysis, and publication.

*Early Iron Age Cemetery Excavation—Dhamar, Yemen*

Dr. De Pietro was the Area Supervisor during the summer of 2004 for the Early Iron Age Cemetery Excavation in Dhamar, Yemen. He supervised the excavation and stratagraphic interpretation, taught excavation techniques, strategy and implementation, field conservation, surveying techniques, data collection and analysis, and site management.

*Journal of Associated Graduates in Near Eastern Studies (JAGNES)*

Dr. DePietro was the Associate Editor from August 2003 to May 2012 for the Journal of Associated Graduates in Near Eastern Studiers (JAGNES). He solicited and proofread submissions, fundraising, and advertisements.

*"Travel Today: Egypt" Magazine*

Dr. De Pietro was an Archaeological Correspondent from December 2002 to February 2005. He wrote magazine articles, conducted relevant interviews and research, and procured photos and images to compliment articles.

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# Appendix D: Regulatory Framework

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# REGULATORY FRAMEWORK

Government agencies, including federal, state, and local agencies, have developed laws and regulations designed to protect significant cultural resources that may be affected by projects regulated, funded, or undertaken by the agency. Federal and state laws that govern the preservation of historic and archaeological resources of national, state, regional, and local significance include the National Environmental Policy Act (NEPA), the National Historic Preservation Act (NHPA), and the California Environmental Quality Act (CEQA). In addition, laws specific to work conducted on federal lands includes the Archaeological Resources Protection Act (ARPA), the American Antiquities Act, and the Native American Graves Protection and Repatriation Act (NAGPRA).

The following federal or CEQA criteria were used to evaluate the significance of potential impacts on cultural resources for the proposed project. An impact would be considered significant if it would affect a resource eligible for listing in the NR or the CR, or if it is identified as a unique archaeological resource.

## Federal-Level Evaluations

Federal agencies are required to consider the effects of their actions on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on such undertakings under NEPA § 106. Federal agencies are responsible for initiating NEPA § 106 review and completing the steps in the process that are outlined in the regulations. They must determine if NHPA § 106 applies to a given project and, if so, initiate review in consultation with the State Historic Preservation Officer (SHPO) and/or Tribal Historic Preservation Officer (THPO). Federal agencies are also responsible for involving the public and other interested parties. Furthermore, NHPA S106 requires that any federal or federally assisted undertaking, or any undertaking requiring federal licensing or permitting, consider the effect of the action on historic properties listed in or eligible for the NRHP. Under the Code of Federal Regulations (CFR), 36 CFR Part 800.8, federal agencies are specifically encouraged to coordinate compliance with NEPA § 106 and the NEPA process. The implementing regulations "Protection of Historic Properties" are found in 36 CFR Part 800. Resource eligibility for listing on the NRHP is detailed in 36 CFR Part 63 and the criteria for resource evaluation are found in 36 CFR Part 60.4 [a–d].

The NHPA established the NRHP as the official federal list for cultural resources that are considered important for their historical significance at the local, state, or national level. To be determined eligible for listing in the NRHP, properties must meet specific criteria for historic significance and possess certain levels of integrity of form, location, and setting. The criteria for listing on the NRHP are significance in American history, architecture, archaeology, engineering, and culture as present in districts, sites, buildings, structures and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association. In addition, a resource must meet one or all of these eligibility criteria:

a.) Is associated with events that have made a significant contribution to the broad patterns of our history.

b.) Is associated with the lives of persons significant in our past.

c.) Embodies the distinctive characteristics of a type, period, or method of construction; represent the work of a master; possess high artistic values, represent a significant and distinguishable entity whose components may lack individual distinction.

d.) That have yielded, or may be likely to yield, information important in prehistory or history.

Criterion D is usually reserved for archaeological resources. Eligible properties must meet at least one of the criteria and exhibit integrity, measured by the degree to which the resource retains its historical properties and conveys its historical character.

### Criteria Considerations

Ordinarily cemeteries, birthplaces, graves of historical figures, properties owned by religious institutions or used for religious purposes, buildings that have been moved from their original locations, reconstructed historic buildings, properties primarily commemorative in nature, and properties that have achieved significance within the past 50 years shall not be considered eligible for the NRHP. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

a.) A religious property deriving primary significance from architectural or artistic distinction or historical importance.

b.) A building or structure removed from its original location but which is primarily significant for architectural value, or which is the surviving structure most importantly associated with a historic person or event.

c.) A birthplace or grave of a historical figure of outstanding importance if there is no appropriate site or building associated with his or her productive life.

d.) A cemetery that derives its primary importance from graves of persons of transcendent importance, from age, from distinctive design features, or from association with historic events.

e.) A reconstructed building when accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and when no other building or structure with the same association has survived.

f.) A property primarily commemorative in intent if design, age, tradition, or symbolic value has invested it with its own exceptional significance.

g.) A property achieving significance within the past 50 years if it is of exceptional importance.

## Thresholds of Significance

In consultation with the SHPO/THPO and other entities that attach religious and cultural significance to identified historic properties, the Agency shall apply the criteria of adverse effect to historic

properties within the Area of Potential Effect (APE). The Agency official shall consider the views of consulting parties and the public when considering adverse effects.

## Federal Criteria of Adverse Effects

Under federal regulations, 36 CFR Part 800.5, an adverse effect is found when an undertaking alters, directly or indirectly, any of the characteristics of a historic property that qualifies the property for inclusion in the NRHP in a manner that diminishes the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration will be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for listing in the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative.

According to 36 CFR Part 800.5, adverse effects on historic properties include, but are not limited to, those listed below:

- Physical destruction of or damage to all or part of the property.
- Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation, and provision of handicapped access, that is not consistent with the U.S. Secretary of the Interior's Standards for the Treatment of Historic Properties per 36 CFR Part 68 and applicable guidelines.
- Removal of the property from its historic location.
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance.
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features.
- Neglect of a property that causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization.
- Transfer, lease, or sale of property out of federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long term preservation of the property's historic significance.

## If Adverse Effects Are Found

If adverse effects are found, the agency official shall continue consultation as stipulated at 36 CFR Part 800.6. The agency official shall consult with the SHPO/THPO and other consulting parties to develop alternatives to the undertaking that could avoid, minimize, or mitigate adverse effects to historic resources. According to 36 CFR Part 800.14(d), if adverse effects cannot be avoided then standard treatments established by the ACHP may be used as a basis for Memorandum of Agreement (MOA).

According to 36 CFR Part 800.11(e), the filing of an approved MOA, and appropriate documentation, concludes the § 106 process. The MOA must be signed by all consulting parties and approved by the ACHP prior to construction activities. If no adverse effects are found and the SHPO/THPO or the ACHP do not object within 30 days of receipt, the agencies' responsibilities under § 106 will be satisfied upon completion of report and documentation as stipulated in 36 CFR Part 800.11. The information must be made available for public review upon request, excluding information covered by confidentiality provisions.

## State-Level Evaluation Processes

An archaeological site may be considered an historical resource if it is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military or cultural annals of California per PRC § 5020.1(j) or if it meets the criteria for listing on the CR per California Code of Regulations (CCR) at Title 14 CCR § 4850.

The most recent amendments to the CEQA guidelines direct lead agencies to first evaluate an archaeological site to determine if it meets the criteria for listing in the CR. If an archaeological site is an historical resource, in that it is listed or eligible for listing in the CR, potential adverse impacts to it must be considered as stated in PRC §§ 21084.1 and 21083.2(l). If an archaeological site is considered not to be an historical resource, but meets the definition of a "unique archeological resource" as defined in PRC § 21083.2, then it would be treated in accordance with the provisions of that section.

With reference to PRC § 21083.2, each site found within a project area will be evaluated to determine if it is a unique archaeological resource. A unique archaeological resource is described as an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets one or more of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

As used in this report, "non-unique archaeological resource" means an archaeological artifact, object, or site that does not meet the criteria for eligibility for listing on the CR, as noted in subdivision (g) of PRC § 21083.2. A non-unique archaeological resource requires no further consideration, other than simple recording of its components and features. Isolated artifacts are typically considered non-unique archaeological resources. Historic structures that have had their superstructures demolished or removed can be considered historic archaeological sites and are evaluated following the processes used for prehistoric sites. Finally, OHP recognizes an age

threshold of 45 years. Cultural resources built less than 45 years ago may qualify for consideration, but only under the most extraordinary circumstances.

Title 14, CCR, Chapter 3 § 15064.5 is associated with determining the significance of impacts to archaeological and historical resources. Here, the term historical resource includes the following:

1. A resource listed in, or determined eligible by the State Historical Resources Commission, for listing in the CR (PRC § 5024.1; Title 14 CCR, § 4850 et seq.).
2. A resource included in a local register of historical resources, as defined in PRC § 5020.1(k) or identified as significant in an historical resource survey meeting the PRC § 5024.1(g) requirements, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.
3. Any object, building, structure, site, area, place, record, or manuscript, which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of Historical Resources (PRC § 5024.1; Title 14 CCR § 4852) including the following:
   A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
   B. Is associated with the lives of persons important in our past.
   C. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
   D. Has yielded, or may be likely to yield, information important in prehistory or history.

Typically, archaeological sites exhibiting significant features qualify for the CR under Criterion D because such features have information important to the prehistory of California. A lead agency may determine that a resource may be a historical resource as defined in PRC §§ 5020.1(j) or 5024.1 even if it is:

- Not listed in or determined to be eligible for listing in the CR.
- Not included in a local register of historical resources pursuant to PRC § 5020.1(k).
- Identified in an historical resources survey per PRC § 5024.1(g).

## Threshold of Significance

If a project will have a significant impact on a cultural resource, several steps must be taken to determine if the cultural resource is a "unique archaeological resource" under CEQA. If analysis and/or testing determine that the resource is a unique archaeological resource and therefore subject to mitigation prior to development, a threshold of significance should be developed. The threshold

of significance is a point where the qualities of significance are defined and the resource is determined to be unique under CEQA. A significant impact is regarded as the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource will be reduced to a point that it no longer meets the significance criteria. Should analysis indicate that project development will destroy the unique elements of a resource; the resource must be mitigated for under CEQA regulations. The preferred form of mitigation is to preserve the resource in-place, in an undisturbed state. However, as that is not always possible or feasible, appropriate mitigation measures may include, but are not limited to:

1. Planning construction to avoid the resource.
2. Deeding conservation easements.
3. Capping the site prior to construction.

If a resource is determined to be a "non-unique archaeological resource," no further consideration of the resource by the lead agency is necessary.

## Tribal Consultation

The following serves as an overview of the procedures and timeframes for the Tribal Consultation process. For the complete Tribal Consultation Guidelines, please refer to the State of California Office of Planning and Research website.

Prior to the amendment or adoption of general or specific plans, local governments must notify the appropriate tribes of the opportunity to conduct consultation for the purpose of preserving or mitigating impacts to cultural places located on land within the local government's jurisdiction that is affected by the plan adoption or amendment. The tribal contacts for this list are maintained by the NAHC and is distinct from the Most Likely Descendent (MLD) list. It is suggested that local governments send written notice by certified mail with return receipt requested. The tribes have 90 days from the date they receive notification to request consultation. In addition, prior to adoption or amendment of a general or specific plan, local government must refer the proposed action to tribes on the NAHC list that have traditional lands located within the city's or county's jurisdiction. Notice must be sent regardless of prior consultation. The referral must allow a 45-day comment period.

In brief, notices from government to the tribes should include:

- A clear statement of purpose
- A description of the proposed general or specific plan, the reason for the proposal, and the specific geographic areas affected
- Detailed maps to accompany the description
- Deadline date for the tribes to respond
- Government representative(s) contact information
- Contact information for project proponent/applicant, if applicable

The basic schedule for this process is:

- **30 days:** time NAHC has to provide tribal contact information to the local government; this is recommended not mandatory.
- **90 days:** time tribe has to respond indication whether or not they want to consult. Note: tribes can agree to a shorter timeframe. In addition, consultation does not begin until/unless requested by the tribe within 90 days of receiving notice of the opportunity to consult. The consultation period, if requested, is open-ended. The tribes and local governments can discuss issues for as long as necessary, or productive, and need not result in agreement.
- **45 days:** time local government has to refer proposed action, such as adoption or amendment to a general plan or specific plan, to agencies, including the tribes. Referral required even if there has been prior consultation. This opens the 45-day comment period.
- **10 days:** time local government has to provide tribes of notice of public hearing.

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# Appendix E:
# Confidential NWIC Records Search Results

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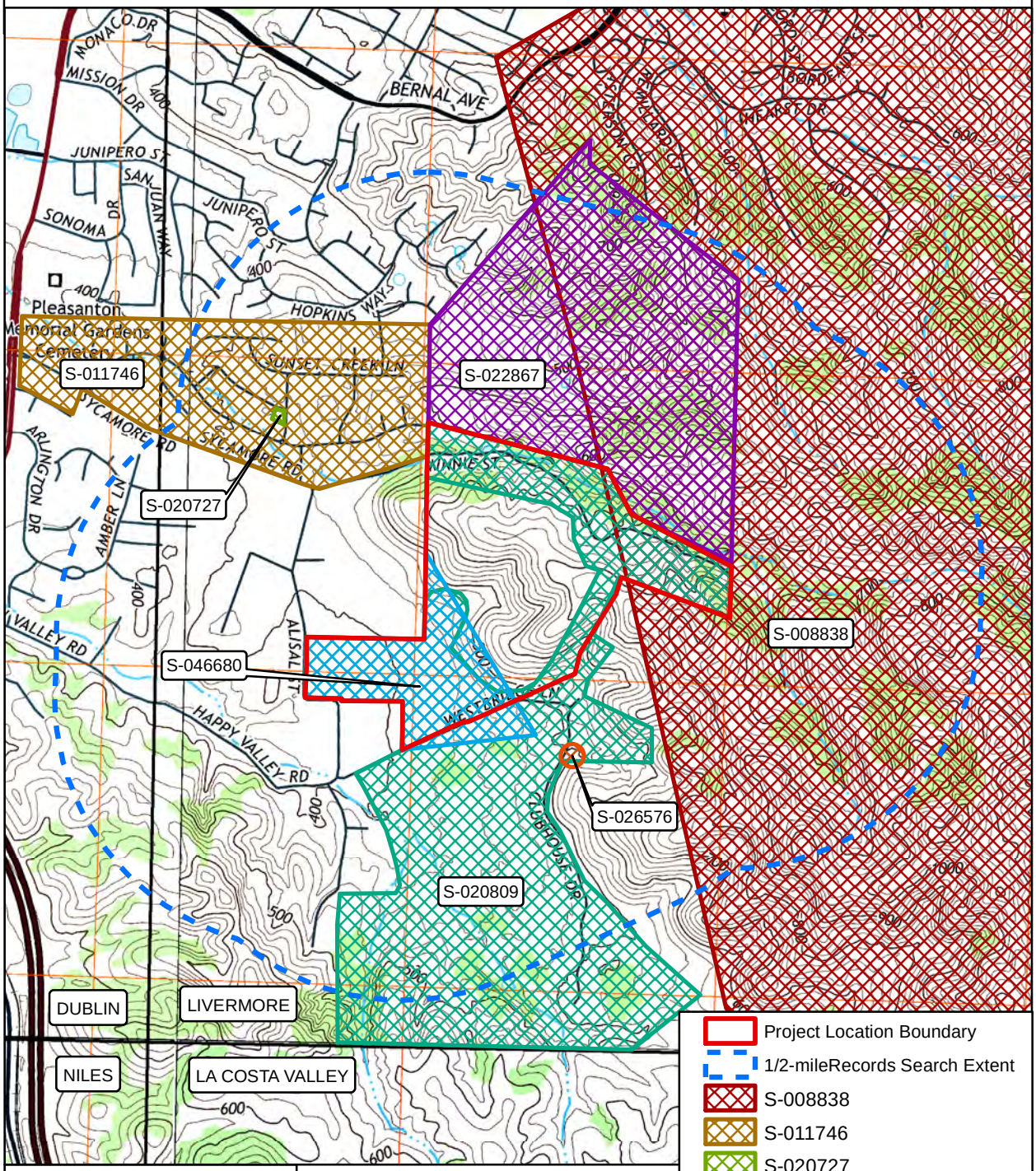
# Sportono Development
# Records Search Results Map: Reports




USGS 7.5' Maps:
Livermore, Dublin, Niles,
and La Costa Valley 2015

GLO: Valle De San Jose Land Grant

NAD 1983, Zone 10 N

N

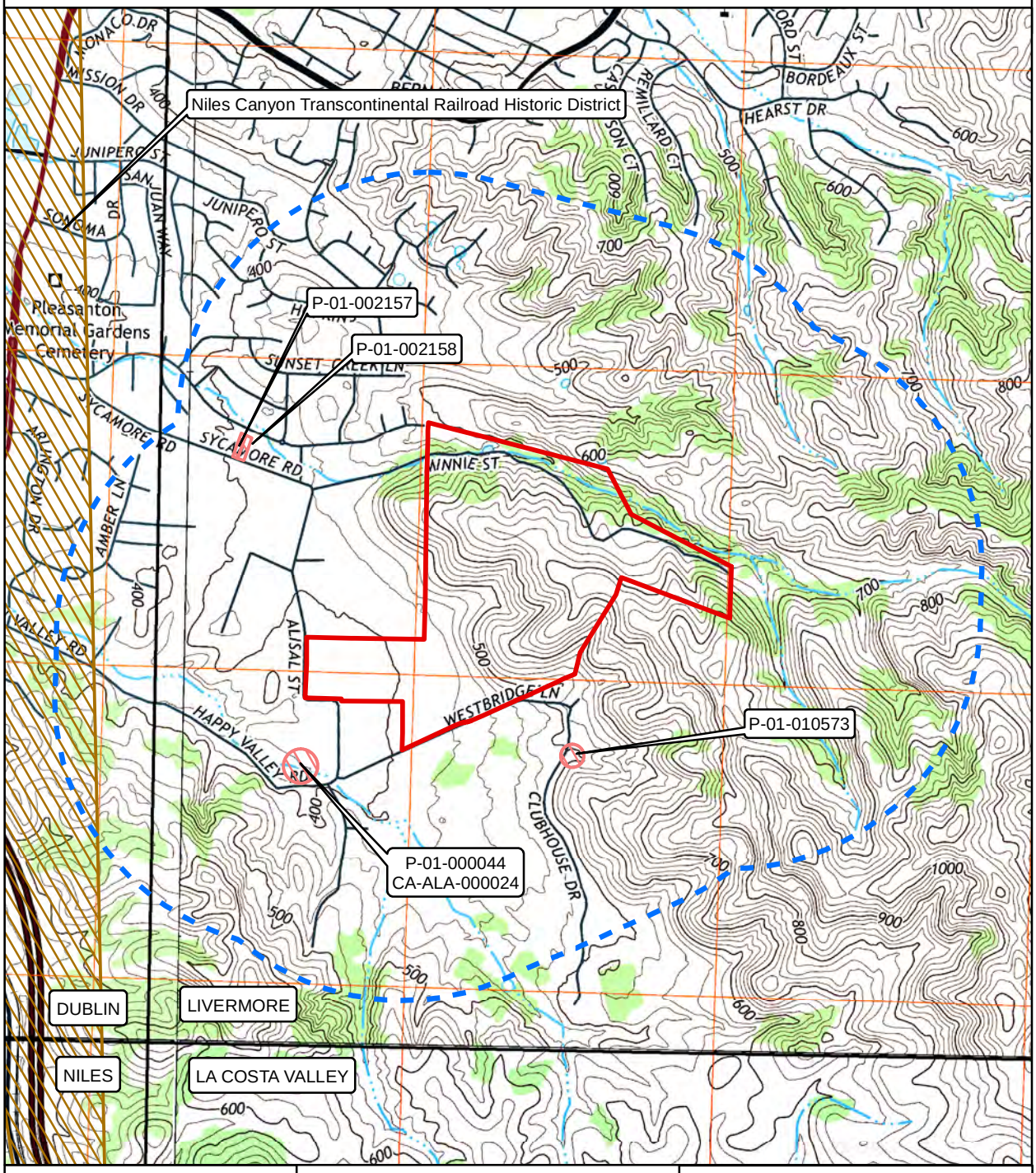
MN 13º East

0 125 250 500 Meters

0 500 1,000 2,000 Feet

Cultural Resources Practitioners, LLC.
C. Mikulik 2/15/2018

# Sportono Development
# Records Search Results Map: Resources




USGS 7.5' Maps:
Livermore, Dublin, Niles,
and La Costa Valley 2015
GLO: Valle De San Jose Land Grant

NAD 1983, Zone 10 N

N

0 125 250 500 Meters

0 500 1,000 2,000 Feet

MN 13º East

Project Location Boundary
1/2-mileRecords Search Extent
Cultural Resources
National Register District

Cultural Resources Practitioners, LLC.
C. Mikulik 2/15/2018

## Resource List

| Primary No. | Trinomial | Other IDs | Type | Age | Attribute codes | Recorded by | Reports |
|---|---|---|---|---|---|---|---|
| P-01-000044 | CA-ALA-000024 | Resource Name - [none] | Site | Prehistoric | AP15 | 1950 (Scott Wilson, [none]) | S-000934 |
| P-01-002157 | | Resource Name - 878 Sycamore Road, House No. 1 | Building | Historic | AH15 | 1997 (Donald Napoli) | S-011746, S-020727 |
| P-01-002158 | | Resource Name - 878 Sycamore Road, House No. 2 | Building | Historic | AH15 | 1997 (Donald Napoli) | S-011746, S-020727 |
| P-01-010573 | | Resource Name - Manning Barn | Building | Historic | HP33 | 2002 (Kimberley Popetz, WSA) | S-026576 |

# Report List

| Report No. | Other IDs | Year | Author(s) | Title | Affiliation | Resources |
|---|---|---|---|---|---|---|
| S-008838 | | 1985 | John Holson | Preliminary Cultural Resources Study for the Proposed Vineyard Substation and 230 kV Transmission Line Tap | Hager/Holson & Associates | |
| S-011746 | | 1990 | | Archaeological Field Inspection of the Proposed North Sycamore Specific Plan Area, Pleasanton, Alameda County, California (letter report) | Holman and Associates | 01-002157, 01-002158 |
| S-020727 | | 1997 | William Roop | A Historical Resources Evaluation of 878 Sycamore Road (Parcel 18 of the North Sycamore Specific Plan Area), Pleasanton, Alameda County, California | Archaeological Resource Service | 01-002157, 01-002158 |
| S-020809 | | 1998 | Lori Harrington and Carrie D. Wills | Cultural Resources Assessment Report, Happy Valley Project Area, Pleasanton, Alameda County, California | William Self Associates | |
| S-022867 | | 1999 | Eric Strother and Amy McCarthy | A Cultural Resources Evaluation of the Lund Ranch II Project, Pleasanton, California | Archaeological Resource Service | |
| S-026576 | | 2002 | William Self Associates | Manning Barn Documentation Alameda County, California | | 01-010573 |
| S-046680 | | 2015 | Matthew R. Clark | Archaeological Reconnaissance of the Spotorno Property project area in the city of Pleasanton, Alameda County, California | Holman & Associates | |

S-46680 S-46680

# ARCHAEOLOGICAL RECONNAISSANCE OF THE SPOTORNO PROPERTY PROJECT AREA IN THE CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA

by

Matthew R. Clark, RPA #10130

February 2015

Report Completed For

Tim Lewis Communities
12667 Alcosta Blvd., Suite 170
San Ramon, CA 94583

**HOLMAN & ASSOCIATES**
**ARCHAEOLOGICAL CONSULTANTS**
**3615 FOLSOM STREET**
**SAN FRANCISCO, CA 94110**
**415-550-7286**
**HOLMAN.ASSOC@COMCAST.NET**

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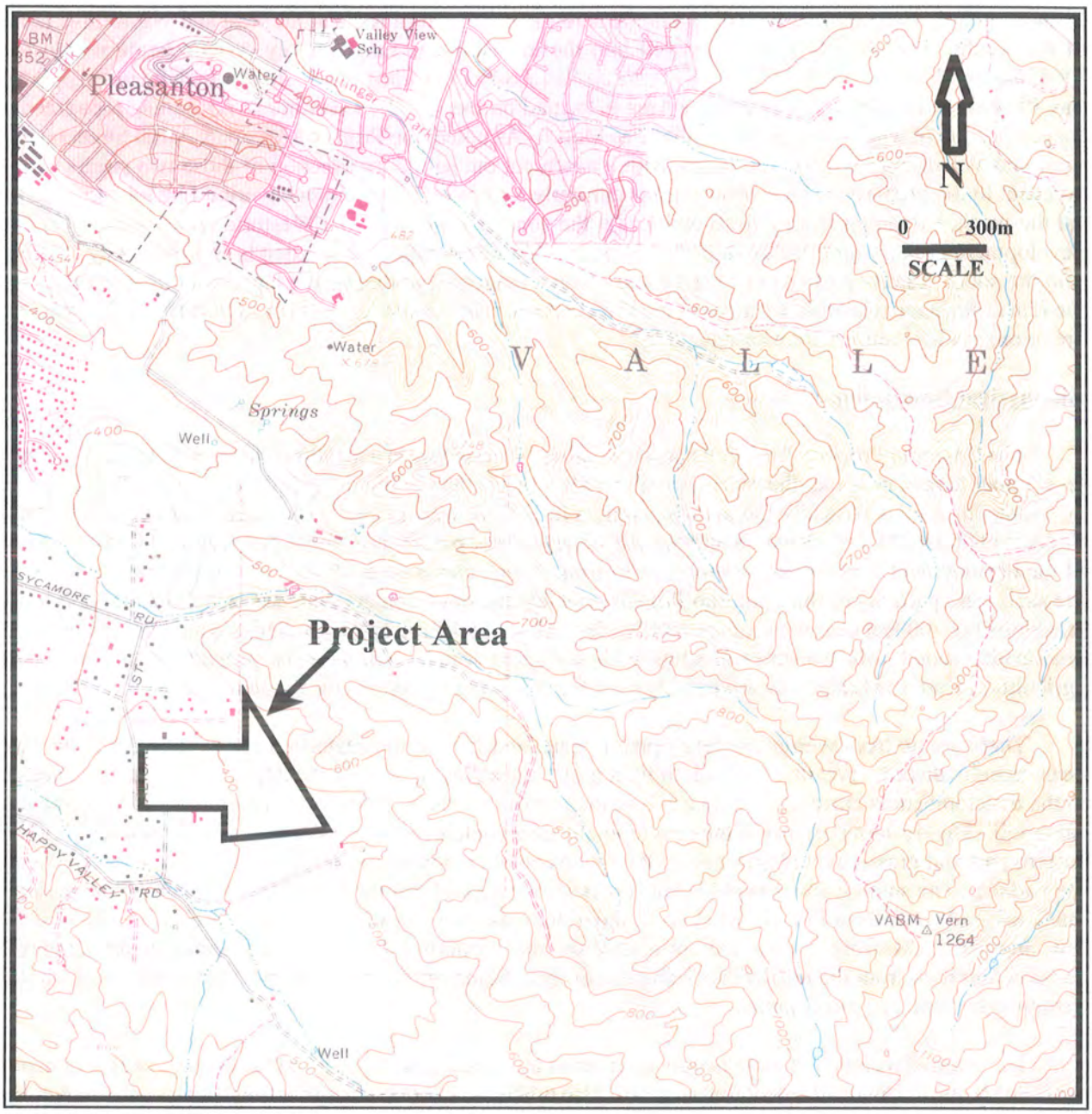
## INTRODUCTION AND PROJECT SUMMARY

In January 2015, Holman & Associates Archaeological Consultants (H&A) completed a pedestrian general reconnaissance of approximately 33 acres of the "Spotorno Property Project Area" (Project/Project Area) slated for development, in the southern part of the City of Pleasanton, California. This research was authorized by and conducted for Mr. Michael O'Hara of Tim Lewis Communities in San Ramon. The Project Area has street frontage on Alisal Street at the west and Westbridge Lane at the south. A larger portion of the property to the east and north, about 78 steeply hilly acres, will remain undeveloped and was not subjected to the same level of inspection as the flatter southwesterly portion. Residential development will require general grading, installation of access and circulation roads, utilities, and other work; this work could affect archaeological resources within the Project impacts areas. This archaeological reconnaissance was required by under provisions of the California Environmental Quality Act (CEQA) and under relevant local land-use and planning codes.

The archaeological reconnaissance and initial evaluation of the Ardenwood Creek Watershed Project Area entailed three steps. A search of relevant records and maps maintained by the Northwest Information Center (NWIC) of the California Historical Resources Information System (CHRIS) at Sonoma State University was completed by H&A staff to determine whether the property and/or areas nearby had been previously surveyed or contained previously recorded archaeological or other cultural resources. A pedestrian surface reconnaissance was conducting covering the entire development zone of the Project Area. This report and the recommendations below constitute the third step of initial archaeological resources research for this Project Area and proposed construction work.

The historical records search found that the Spotorno Property had been included in a 1998 cultural resources assessment of the "Happy Valley Project Area" (William Self Associates [WSA] 1998), which reported no prehistoric archaeological sites or other historical resources on the current subject portion of the property. A historic barn was subsequently recorded off the property to the south (WSA 2002), across Westbridge Lane, which is no longer extant. One prehistoric archaeological site was found to be recorded within about 200 meters of the Project Area, described as a prehistoric occupation site (Wilson 1950). No other sites or historical resources are recorded within the records search area, and no other reports cover any part or are adjacent to the Project Area

The general pedestrian reconnaissance found surface conditions generally good on the westernmost portion of the 33 acres, but poor on a strip of land contiguous to the east that where parcel lines will be adjusted for inclusion in the development project. No evidence of prehistoric cultural resources or archaeological sites was found on the development zone and no additional research or mitigation measures are recommended for prehistoric resources, subject to the proviso at the end of this report. A windmill over 50 years old is located in the southwestern portion of the finger of property reaching Alisal Street at the west; this is not considered a significant historical resources but its location and characteristics should be recorded prior to removal for development as evidence of the long agricultural history and use of lands in the Livermore/Amador Valley.




**Map 1:** Spotorno Property Project Area Location.
(USGS "Livermore, Calif." 7.5 minute topographic quadrangle, photorev. 1980)

## THE PROJECT AREA AND PROJECT

### Location and Legal Description

The Spotorno Property Project Area is located in southern Pleasanton in Alameda County. The property is an irregularly shaped piece with nine straight sides, abutting Alisal Road at the west and Westbridge Lane at the south. The vicinity is not surveyed into the township-and-range survey system, being within the 48,436-acre Mexican-era (1839) *Rancho Valle de San José y Corralitos* Land Grant, which included present day Pleasanton and Sunol. The Project Area is located on the USGS "Livermore" 7.5 minute topographic map, a portion of which is reproduced above as Map 1. As noted, the Project Area abuts Alisal Street on the west and Westbridge Way on the south, with a notch cut out so the intersection of those two streets is not adjacent to the property. The Project Area is currently a single parcel number covering five lots; Lots 8, 12 (at the north, extending from Alisal) and 13 (at the south, extending from Westbridge) are entirely in the development impacts zone and contain 29.171 acres. The development zone extends approximately 150 feet into the southwesterly portions of Lots 14 and 15 on a diagonal paralleling the current lot lines, making up the remaining approximately 3.8 acres of the Project Area. The remainders of Lots 14 and 15, about 78 acres, are to remain in a conservation easement.

### Biophysical Description

The Spotorno Property Project Area is in southern Pleasanton, at a location where the relatively flat and level upper terrace in the southeasterly Amador Valley meets the steeply rising hills to the east. The ~33 acre development zone is basically flat and rises only a little from west to east. The western boundary at Alisal Street is at about 385 feet elevation and the east edge of those parcels is at about 413 feet; at the eastern limit of the development zone, about ⅓ mile/525 m from Alisal, elevation is about 430 feet and rises rapidly to the east. The portions of the Spotorno Property outside the development zone are steep hillsides and tops, reaching over 700 feet near the southeastern border. Aboriginally this terrace and hills would have been open grasslands, dotted with oak trees at spots with sufficient water. The modern property is entirely open agricultural land, the flatter western parcels used for crops and the slopes for livestock pasture.

There are no trees within the development zone, and few on the easterly parcels. The flat fields had been recently disced, revealing medium to light grey brown clayey silt soil; the adjacent portion to be added to the development is currently separated from the plowed fields by a post-and-wire fence and contains the same soil. The western portions of the development zone contained rare rounded gravel and pebbles, but the eastern part and grass-covered area east of the fence contain many more rounded rocks up to cobble size on the surface. The small gravel to cobble sized rocks are derived from the Franciscan Formation and include many mineral types from Franciscan chert to indurated sandstone/greywacke and various metamorphics. A few angular rocks were also noted, primarily on the western side, which are probably all imported construction rock from the nearby roads and driveways. Some of the numerous pebbles and cobbles on the eastern side displayed plow marks.

The entire development zone is now dominated by annual grasses of Eurasian origins, sparse in many areas due to the discing and recent low rainfall. Also noted were some sedge in wetter spots, dock (both curly and broad-leaf?), brassicas (wild radish and mustard), morning glory vines, red filaree, a couple thistles, and some not yet in bloom flower bulbs along the southwestern border.

Mr. Al Spotorno, patriarch of the family that has held and farmed land in the region since 1867, the same year Pleasanton was named, paid a visit during our field survey. Mr. Spotorno said the plowed development parcels had been dry farmed by his family since they had arrived. Prior to Prohibition, the fields had been in grapes for up to 50 years, which were removed and field crops including wheat and hay had been

grown there since. No structures have ever been built on the development zone with the exception of an old windmill still standing in the southwestern portion. Mr. Spotorno said the existing windmill (Figure 1), used to pump water from the well, is something well over 50 years old and had replaced an even earlier wooden structure; the windmill is discussed more below.

**Ethnographic Setting**

The Native Americans who owned the coast from the Golden Gate to the Carmel area and inland to about the crest of the Diablo Range when the Spanish arrived in 1769 are now most commonly known as "Ohlones," a name from an ocean coast village or tribe near the current Project Area. Archaeological evidence indicates the ancestral Ohlones entered the San Francisco Bay region–depending on location–somewhere around 500 C.E. (Moratto 1984), probably from the lower Sacramento Valley, and the Monterey Bay area somewhat later, displacing earlier populations. Anthropologists labeled them "Costanoans," from the Spanish *Costanos* (coast-dwellers), also a linguistic term describing groups speaking related languages in the Penutian Stock. Some Ohlone descendants still prefer the term "Costanoan," while others prefer "Ohlone" or identify with more specific tribes such as Chochenyo, Amah, Mutsun, or Rumsen/Rumsien.

The best current information indicates at the Spanish invasion the very small *Pelnen* tribe of Ohlones/Costanoans held the general Project Area vicinity. Another perhaps even smaller group, the *Causen*, were located in the Sunol Valley, and were intermarried with the *Pelnens*, and it seems possible the two groups were actually parts of a larger tribe, possibly including other Pleasanton/Sunol area villages.

> The Pelnen tribe held the western part of the Livermore Valley in the area of the present town of Pleasanton, north no farther than the present Dublin area, and south to the canyon leading to Sunol Valley. Another small group of about six families, the Caburans, seem to have inhabited a subsidiary village of the Pelnens, since a number of nuclear families at Mission San Jose had both Pelnen and Caburan members. ... The two groups joined Mission San Jose between 1798 and 1805 [Milliken 1995:251].

Marriage ties and the number of inductees into the missions indicate the *Pelnens* seem to have been a small group of perhaps several bands located between larger tribes to the north, south, and west, their territory probably restricted by those larger populations, largely unable to supply internal marriage partner, and affiliated with groups both in proximity and along the shores of San Francisco Bay. Clearly the Project Area vicinity was permanently if sparsely occupied at contact, probably with both small permanent and seasonally occupied villages, and likely had been for millennia. The Project region certainly was used aboriginally for habitation and specific locales for specific tasks, such as gathering and processing food resources, and the nearby freshwater marshes, and permanent and seasonal streams in the vicinity contain archaeological sites, but population was probably always small.

Natural resources in their home areas provided for nearly all the needs of the aboriginal Ohlone. They were "hunters and gatherers," which may connote a transient, unstable and "primitive" life, materially poor, constantly fending off starvation; it should not. While undoubtedly recurrent lack of resources and cultural strife did not make life perpetually easy, in some ways the people of Central California, without agriculture, had a lifestyle similar to contemporary agricultural peoples elsewhere. The Ohlone had adapted to and managed their generally abundant local environment so well that some places were continuously occupied for literally thousands of years. Compared to modern standards, population density was always low, but the Ohlone area, especially around Monterey and San Francisco Bays, was one of the most densely lived-in areas of prehistoric California for centuries. The Ohlones had perfected living in and managing myriad differing environments, some rich enough for large permanent villages of "collectors" to exist, others less abundant and promoting a more mobile "forager" way of life. Littoral and riparian environments were obviously more

productive and therefore most sought, most intensively utilized and occupied, and most jealously defined and guarded. Uplands and redwood zones were less productive and less intensively used and occupied than the ocean and bay coasts and riparian corridors. As throughout Central California, the acorn was a dietary staple, but a huge number of floral and faunal resources were utilized. Like other native Californians, the Ohlone managed their environment to improve it for their use; for example, by burning grass and brush lands annually to improve forage for deer and rabbits, keep the land open and safer from predators and their neighbors, and improve productivity of many resources they used.

The basic Ohlone social unit was the tribe, a small independent group of usually related families occupying a specific territory and speaking the same dialect. A wide diversity of languages had evolved in Central California, evidence of centuries of in-place divergence of small social groups. Early linguists recorded some groups of only 50-100 people speaking distinct languages sometimes but not generally unintelligible to their neighbors. Inter-tribe relationships were socially and economically necessary, however, to supply both marriage partners and goods and services not locally available. Trade and marriage patterns were usually but not always dictated by proximity; traditional enemies were usually also defined by proximity. Regional festivals and religious dances brought groups together during periods of suspended hostilities

Traditional trade patterns had operated for thousands of years. Trade supplied the Ohlone with goods from sources sometimes several hundred kilometers distant and allowed export of goods unique to their region. Ohlone groups traded most with each other, but also exchanged regularly with groups in every direction, such as the Miwok, Yokuts, and the Pomo. Of particular interest archaeologically are imported obsidian and exported marine shell beads and ornaments. Obsidian artifacts can be traced to specific sources, as well as being datable by technical methods ("hydration"). Obsidian was obtained from the North Coast Ranges and Sierran sources in patterns that changed through time. By 1769, some Ohlone had been trading for or buying finished obsidian arrowheads of specific forms, made by North Coast tribes, for hundreds of years.

Shell beads and ornaments, a major export from the Ohlone regions, were made primarily from the Purple Olive snail (*Olivella*), abalone (*Haliotis*), and later Washington Clam (*Saxidomus*), all ocean coast species. Shell beads and ornaments were produced in definable types through the millennia, making chronological typing of these common artifacts a key to the age and relative cultural position of archaeological complexes. These beads have been found in prehistoric sites throughout California and many kilometers east, into the Great Basin, showing that prehistoric coastal peoples were tied into an "international" trade system. At the Spanish invasion, some Central Californians had developed a system of exchange currency or "money" based on clam shell disk beads; the extent to which the Ohlone related to that system is unknown.

The small tribes were both independent and interdependent. Trade with neighbors in goods, and wives, is strongly attested in both the archaeological record and ethnographic accounts. These relationships often moved both goods–particularly obsidian and shell beads–and sometimes individuals long distances, though proximity was always the key factor in intensity of interaction (Milliken 1995). As elsewhere, control of territory and resources was jealously guarded. Such interaction also included a significant component of interpersonal and intergroup violence, from individual disputes to clan feuds to a level reasonably described as warfare (with the goal of displacing neighbors and claiming desirable resources). The most typical weapons were the short thrusting spear and the bow and arrow, and archaeological evidence of use of both on humans is not lacking. The Spanish also reported ongoing multigenerational feuds or warfare in Ohlone territory. Such violence had social approval and prestige, as exemplified by the practice of dismembering dead foes, taking and displaying trophy heads, and composing "songs of insult or vengeance" toward enemies (Kroeber 1925:468-469). Postmortem dismemberment is documented at numerous Ohlone sites (Wiberg

1993, 2002, 2010; Grady et al. 2001; Hylkema 2002; Schwitalla 2013). The too-common stereotype of Central California natives as altogether peaceable and passive in the face of threats–from their neighbors or the Spanish–is contradicted by both historical and archaeological evidence. As everywhere, the contest for resources and territory, as well as individual disputes, often led to violent aggression in and between the Ohlone tribes, and between Native Americans and European invaders.

Absolute and relative dating of archaeological sites, the linguistic diversity, and demonstrably ancient trade patterns all indicate the Ohlone and other Central California groups had reached a state of demographic and social stability unimaginable to modern city-dwellers–a state in which the same family groups occupied the same location continuously for hundreds or even thousands of years with few or very slow changes in population size or profile. This long term stability is reflected in the homogeneity of archaeological sites spanning wide geographic and temporal ranges.

## HISTORICAL RESOURCES RECORDS SEARCH RESULTS

An historical resources records search for the Spotorno Property Project was conducted by Holman & Associates at the Northwest Information Center (NWIC) of the CHRIS on 26 January 2015. The records search radius was 200 m/one-eighth mile around the Project location. The records search revealed the entire Project Area had been included in a cultural resources assessment of the Happy Valley Project Area in 1998 "Happy Valley Project Area" (William Self Associates [WSA] 1998), which reported no prehistoric archaeological sites or other historical resources on the current subject portion of the property. A historic barn on Spotorno property was subsequently recorded off the subject property to the south (WSA 2002), across Westbridge Lane; that barn is no longer extant. The 1998 WSA report notes that by 1830 European agriculture and livestock had been introduced to the Pleasanton area, with subsequent water control, drainage and storage, and filling of wetlands projects altering both the topography and ecology of the Project vicinity significantly.

One prehistoric archaeological site was found to be recorded within about 200 meters of the Project Area, CA-ALA-24, described as a prehistoric occupation site (Wilson 1950). ALA-24 is or was (no other documents for this site were found and the vicinity is now developed) "On the Andreson Ranch. On a knoll behind the ranchhouse. ... An occupation site that has yeilded [sic] mortars, pestles and arrowheads" (Wilson 1950:1). No other recorded sites or historical resources are recorded within the records search area, and no other reports cover any part or are adjacent to the Project Area.

The historical resources records search included searching for recorded resources in the California Inventory of Historical Resources (1976), the Office of Historic Preservation Historic Properties Directory (April 2012), and a check of historic maps at the NWIC. The NWIC File Number for the Spotorno Property Project is 14-0949. A copy of this report will be filed for permanent archiving at the NWIC as required by the State.

## RECONNAISSANCE METHODS

A general surface reconnaissance of the Spotorno Property Project Area (King, Moratto, and Leonard 1973). The Spotorno Property Project Area is entirely outlined by fences, making definition of the reconnaissance area in the field easy and accurate. The development zone is defined by the two roads, Alisal Street and Westbridge Lane, and fences, except at the northeast, where the existing lot boundary is fenced. The development zone extends eastward about 150 feet parallel to the fence, approximately to just below a farm road running on the contour near the base of the easterly steep slope. The development zone was accessed through a gate at where northward Alisal Street hits the southwest of the property and surveyed by the author and a H&A Archaeological Technician, both with several decades of survey experience. The area

was covered in north/south transects approximately 15 to 20 m apart. The recently plowed flatter fields afforded good to poor surface visibility; the eastward extension of the development zone beyond the field fence offered very poor to nonexistent surface visibility due to very thick annual grasses and other vegetation. Soils encountered and the increasing presence of rocks on the surface eastward are described above. In addition, east of the development zone, the highest spot on the overall property was hiked to so the property outside the development could be viewed, presenting thickly grass-covered steep hills to the east and north of low archaeological sensitivity.

## RECONNAISSANCE RESULTS

No evidence of prehistoric cultural use or archaeological resources was found on the Spotorno Property Project Area by surface survey, nor are any recorded on this previously surveyed parcel. Surface survey was quite adequate except in the easterly extension of the development zone, where high thick grass made the surface virtually invisible.

The only structure on the development zone, and the only one to ever exist there according to Mr. Spotorno, is the existing windmill in the southwest of that zone (Figure 1). Its location is directly north of the point where Alisal Street approaches the property from the south, about 175 feet from the road. The windmill is labeled on the wind vane "The Aermotor Co./Chicago" and appears to be an 8-foot Aermotor Model 702, a very common windmill throughout the country, introduced in 1933 and still manufactured and in use widely (Baker 1985, 1999; Nayab 2011). As noted, Mr. Spotorno said the current metal windmill at been in place more than 50 years and had replaced an earlier wooden structure over the same wellhead; it probably dates to the 1930s. "The self-oiling Aermotor 602 and Aermotor 702 windmills, produced between 1916 and the early 1950's in the United States, are by far the most common & popular of all the water pumping windmills made in the twentieth century" (Aermotor-parts.com 2015).

Adjacent to the windmill and well is an old unreinforced concrete, metal-line trough, also over 50 years old, and just west of the windmill base another concrete wellhead or cistern pad is found. Several fragments of old, probably late nineteenth/early twentieth century red brick fragments were scattered on the surface and wellhead pad; one piece of firebrick was partially labeled "STOC..." and so came from the Stockton Brick Company, in business since 1907. About 120 feet away to the southeast, near the fence, a since piece of unmarked white improved earthenware was found on the surface, and near the entry gate a fragment of pre-1915 (clear glass tinted amethyst by solar exposure) glass bottle base was found, with partial embossing "...d KE..." remaining.

**Figure 1:** Aermotor Windmill on Spotorno Property Project Area, January 2014.

## CONCLUSION AND RECOMMENDATIONS

No evidence of prehistoric archaeological resources was found on the Spotorno Property Project Area, nor were any previously recorded. The property had been previously surveyed, also with negative results for prehistoric resources. Conditions for this survey were very good, and the constant, at least annual plowing and discing of the property for about 80 years probably would have revealed any near-surface archaeological deposits. The location would be generally of medium-low archaeological sensitivity.

The historic windmill on the property is too common a make and type and has been altered too recently to qualify as an historical resource under CEQA. However, it is the only material evidence on the property of the long tenure and utilization of the property by generations of the Spotorno family, which played a locally significant part in the historical development and maintenance of agriculture and ranching in the Livermore Valley since the mid-nineteenth century. Further, there are scant historical materials at and around the windmill site that are probably older than the circa-1930s windmill itself. As such, a record should be made of the location and characteristics of the windmill before it is removed for development.

### Recommendations

1. No additional research or possible mitigative measures are recommended regarding prehistoric archaeological resources on the Spotorno Property Project Area. However, although no archaeological or other historical resources were found on the Project Area, it is possible that subsurface deposits may exist or that evidence of such resources has been obscured by more recent natural or cultural factors, primarily the extensive rearranging of the local landscape, many years of agricultural use, and installation of modern features. Archaeological and historic resources are protected from unauthorized disturbance by State law, and supervisory and construction personnel should therefore be made aware of the possibility, scant though it may be, of encountering archaeological materials in this zone.

In this area, the most common and recognizable evidence of prehistoric archaeological resources are areas with darker fine-grained soil (midden), carbon/charcoal and burnt rocks, often containing bones and shellfish such as clams and mussels, usually in fragments; chert, obsidian, basalt, and other stone flakes left from manufacturing stone tools, or the tools themselves (mortars, pestles, arrowheads and spear points), and human burials, often as dislocated bones. Historic materials older than 45 years–bottles, artifacts, features, structural remains, etc.–may also have scientific and cultural significance and should be more readily identified. If during the proposed construction project any such evidence is uncovered or encountered, all excavations within 10 meters/30 feet should be halted long enough to call in a qualified archaeologist to assess the situation and propose appropriate measures.

2. The Aermotor Windmill located on the property should be recorded on appropriate Department of Parks and Recreation DPR historical resources forms, along with being photographed for that record. The windmill does not qualify as an historical resource requiring additional research or other mitigation of effects efforts required under CEQA, but as the only tangible evidence of the long Spotorno family presence on and use of the property, and as an example of facilities used allowing the historically significant long agricultural and pastoral use of the lands around Pleasanton and the western Livermore/Amador Valley, its recording prior to removal is warranted.

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# Appendix F:
# Paleontological Records Search Results

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# Kenneth L. Finger, Ph.D.
Consulting Paleontologist

18208 Judy St., Castro Valley, CA 94546-2306 510.305.1080 klfpaleo@comcast.net


February 23, 2018

Chinmay Damle
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

**Re: Paleontological Records Search: Spotorno Ranch Project (2148.0015), Pleasanton, Alameda County**

Dear Mr. Damle:

As per your request, I have performed a records search on the University of California Museum of Paleontology (UCMP) database for the Spotorno Ranch project in Pleasanton. The site is an irregular shaped parcel between Sycamore Road to the north and Happy Valley Road/ Westbridge Lane to the south. It is located in Sec. 26, T6N, R8W, Dublin and Livermore quadrangles (1980 USGS 7.5-series topographic maps). Google Earth imagery shows that this is grass-covered rolling terrain that appears to have been used formally for agriculture.

## Geologic Units

The part of the geologic map of Graymer et al. (2006) shows the project site (solid red outline at center) is on Pleistocene alluvium (Qpa), early Pleistocene and/or Pliocene sediments (QTs), and Miocene sedimentary rocks (Tms). All three of these units have the potential of yielding significant paleontological resources. The half-mile search area (dashed red outline) also includes Holocene alluvium (Qha), which is too young to be fossiliferous. Slightly farther to the west are Cretaceous sediments of the Great Valley Complex.

Key to mapped units

| | |
|---|---|
| **Qha** | Alluvium (Holocene) |
| **Qpa** | Alluvium (Pleistocene) |
| **QTs** | Nonmarine & marine sediments (Pleistocene-Pliocene) |
| **Tms** | Marine sediments (Miocene) |
| **Ks** | Great Valley Complex (Cretaceous) |

**Records Search**

The UCMP database lists 64 Pleistocene vertebrate fossil localities (58 Rancholabrean, 6 Irvingtonian) in Alameda County, which have yielded a total of 1071 specimens (see attached faunal list). Many of these specimens have been described and figured in professional publications. For Alameda County, the University of California Museum of Paleontology database lists 64 Pleistocene vertebrate localities. Two of the QTl localities yielded a composite Irvingtonian (early to middle Pleistocene) assemblage of *Mammuthus* (mammoth), *Equus* (horse), Pilosa (ground sloths), *Lepus* (rabbit), and *Clemmys* (pond turtle), whereas the third yielded a *Mammuthus* of Rancholabrean age (late Pleistocene). The 5 Qa localities yielded *Bison bison antiquus* (extinct bison), *Equus*, *Mammut* (mastodon), and *Glossotherium* (ground sloth). Another 7 Pleistocene vertebrate localities are in the east-adjacent Altamont quadrangle. They yielded elements of the Rancholabrean fauna, including *Mammuthus columbi* (Columbian mammoth) and *Glossotherium harlani* (Harlan's ground sloth). For Alameda County, the UCMP database also lists two specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch.

**Remarks and Recommendations**

Hundreds of vertebrate fossils have been collected in Alameda County from Pleistocene alluvium and Miocene marine deposits; hence both are ranked as highly sensitive for significant paleontolgical resources. Those fossil occurrences in alluvium are usually unpredictable, however, because they tend to be scattered due to their post-mortem stream or floodwater transport and deposition. A preconstruction paleontological walkover of Spotorno Ranch is not recommended because the surface of the site is disturbed. Paleontological monitoring of project-related excavations is recommended due to the moderate to high sensitivity of the geological units. Should any significant paleontological resource (i.e., teeth or bones) be encountered, the construction crew should not attempt to remove them, which is likely to result in loss of data or specimen damage. Instead, construction activities should be diverted from the find until a professional paleontologist has evaluated it and, if confirmed as significant, properly recorded and salvaged it. Recovered fossils should then be deposited in an accredited and permanent scientific institution (e.g., UCMP) where they will be properly curated and preserved for the benefit of current and future generations.

Sincerely,

Reference Cited

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# Neogene Vertebrate Fossils from Alameda County

* denotes published specimen(s)

## PLEISTOCENE

Class Chondrichthyes (cartilaginous fish)
- *Myliobatus* (bat ray)

Class Actinopterygii (bony fish)
- *Acipenser* (sturgeon)
- *Archoplites interruptus* (Sacramento perch)
- *Orthodon microlepidotus* (Sacramento blackfish)
- *Gasterosteus aculeatus* (3-spined stickleback)
- *Catostomus occidentalis* (Sacramento sucker)

Class Amphibia (amphibians)
- *Ambystoma* (mole salamanders)
- *Aneides lugubris* (aboreal salamander)
- *Bufo* (toads)*
- *Rana* (common frogs)*
- *Scaphiopus* (southern spadefoot toad)
- *Taricha* (western newts)

Class Reptilia (reptiles)
- *Clemmys marmorata* (western pond turtle)
- *Crotalus* (rattlesnake)
- *Gerrhonotus coeruleus* (alligator lizard)
- *Lampropeltis* (king snake)
- *Phrynosoma* (horned lizard)
- *Pituophis melanoleucus* (San Diego gopher snake
- *Thamnophis* (garter snake)
- *Uta* (sideblotched lizard)

Class Aves (birds)
- *Aechmophorus occidentalis* (western grebe)
- *Anas acuta* (pintail duck)
- *Anas platyrhynchos* (mallard duck)
- *Branta canadensis* (Canadian goose)*
- Meleagridinae (turkey)
- *Neophrontops americanus* (extinct vulture)*

Class Mammalia (mammals)

Order Insectivora (insectivores)
- *Scapanus latimanus* (broad-footed mole)*
- *Sorex* (ornate shrew)

Order Xenartha (ground sloths)
- *Glossotherium harlani* (Harlan's ground sloth)
- *Megalonyx* (flat-footed ground sloth)

Order Lagomorpha (rabbits & hares)
- *Sylvilagus* (cottontail rabbit)
- *Lepus* (jackrabbit)

Order Rodentia (rodents)
- *Dipodomys* (kangaroo rat)
- *Microtus californicus* (California meadow vole)
- *Neotoma fuscipes* (dusky-footed wood rat)
- *Perognathus* (pocket mouse)
- *Peromyscus boylii* (brush mouse)
- *Peromyscus californicus* (California deer mouse)
- *Peromyscus maniculatus* (white-footed mouse)
- *Peromyscus truei* (pinyon mouse)
- *Reithrodontomys raviventris* (saltmarsh harvest mouse
- *Sciurus* (squirrel)
- *Spermophilus beecheyi* (California ground squirrel)
- *Spermophilus bensoni* (Benson ground squirrel)
- *Thomomys bottae* (Botta's pocket gopher)*

Order Carnivora (carnivores)
- *Arctodus* (short-faced bear)
- *Canis dirus* (dire wolf)*
- *Canis latrans* (coyote)*
- *Canis priscolatrans* (small wolf)*
- *Cynodesmus thooides* (extinct canid)
- *Dinobastis* (sabre-toothed cat)*
- *Enhydra lutris* (sea otter)
- *Taxidea* (badger)
- *Felis* (bobcat)
- Pinnipedia (seals, sea lions)
- *Smilodon* (sabre-toothed cat)
- *Vulpes macrotis* (kit fox)*

Order Proboscidea (elephants)
- *Mammut americanum* (American mastodon)
- *Mammuthus columbi* (Columbian mammoth)*

Order Perissodactyla (odd-toed ungulates)
- *Equus caballus* (modern horse)*
- *Equus pacificus* (Pacific horse)
- *Pliohippus interpolatus* (Pliocene horse)
- *Tapirus* (tapir)

Order Artiodactyla (even-toed ungulates)
- *Antilocapra pacifica* (Pacific pronghorn)
- *Bison bison antiquus* (ancient bison)
- *Bison latifrons* (long-horned bison)
- *Bison priscus* (steppe bison)
- *Camelops minidokae* (Minidoka camel)
- *Camelops* (extinct large camel)
- *Capromeryx minor* (diminutive pronghorn)
- *Cervus* (deer, elk)
- *Euceratherium collinum* (shrub-ox)
- *Hemiauchenia* (long-legged llama)*
- *Odocoileus* (mule & white-tailed deer)
- *Platygonus* (large peccary)
- *Sphenophalos* (pronghorn)
- *Tetrameryx* (4-horned deer)*

Order Chiroptera (bats)

## PLIOCENE

Class Actinopterygii (bony fish)
    *Scombridae* (mackerels, tuna, bonitos)
Class Mammalia (mammals)

## MIOCENE

Class Chondrichthyes (cartilaginous fish)
    Selachimorpha (sharks)
Class Actinopterygii (bony fish)
    *Scombridae* (mackerels, tuna, bonitos)
Class Mammalia (mammals)
  Order Lagomorpha (rabbits & hares)
    *Hypolagus* (extinct rabbit)
  Order Carnivora (carnivores)
    *Allodesmus* (extinct pinniped)
    *Kampholophos serrulus** (extinct dolphin)
  Order Proboscidea (elephants)
    *Gomphotherium* (mastodon)
    *Mammut americanum* (American mastodon)
  Order Perissodactyla (odd-toed ungulates)
    *Desmostylus hesperus** (extinct sea cow)
    *Hipparion* cf. *H. mohavense** (Mohave 3-toed horse)
    *Nannippus tehonensis** (Tejon horse)
    *Pliohippus* cf. *P. leardi** (primitive one-toed horse)
    *Pliohippus* cf. *P. tehonensis* (primitive one-toed horse)

# D.2 - Paleontological Report

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# Kenneth L. Finger, Ph.D.
Consulting Paleontologist

18208 Judy St., Castro Valley, CA 94546-2306 510.305.1080 klfpaleo@comcast.net


February 23, 2018

Chinmay Damle
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597

**Re: Paleontological Records Search: Spotorno Ranch Project (2148.0015), Pleasanton, Alameda County**

Dear Mr. Damle:

As per your request, I have performed a records search on the University of California Museum of Paleontology (UCMP) database for the Spotorno Ranch project in Pleasanton. The site is an irregular shaped parcel between Sycamore Road to the north and Happy Valley Road/ Westbridge Lane to the south. It is located in Sec. 26, T6N, R8W, Dublin and Livermore quadrangles (1980 USGS 7.5-series topographic maps). Google Earth imagery shows that this is grass-covered rolling terrain that appears to have been used formally for agriculture.

## Geologic Units

The part of the geologic map of Graymer et al. (2006) shows the project site (solid red outline at center) is on Pleistocene alluvium (Qpa), early Pleistocene and/or Pliocene sediments (QTs), and Miocene sedimentary rocks (Tms). All three of these units have the potential of yielding significant paleontological resources. The half-mile search area (dashed red outline) also includes Holocene alluvium (Qha), which is too young to be fossiliferous. Slightly farther to the west are Cretaceous sediments of the Great Valley Complex.

Key to mapped units

| | |
|---|---|
| **Qha** | Alluvium (Holocene) |
| **Qpa** | Alluvium (Pleistocene) |
| **QTs** | Nonmarine & marine sediments (Pleistocene-Pliocene) |
| **Tms** | Marine sediments (Miocene) |
| **Ks** | Great Valley Complex (Cretaceous) |

**Records Search**

The UCMP database lists 64 Pleistocene vertebrate fossil localities (58 Rancholabrean, 6 Irvingtonian) in Alameda County, which have yielded a total of 1071 specimens (see attached faunal list). Many of these specimens have been described and figured in professional publications. For Alameda County, the University of California Museum of Paleontology database lists 64 Pleistocene vertebrate localities. Two of the QTl localities yielded a composite Irvingtonian (early to middle Pleistocene) assemblage of *Mammuthus* (mammoth), *Equus* (horse), Pilosa (ground sloths), *Lepus* (rabbit), and *Clemmys* (pond turtle), whereas the third yielded a *Mammuthus* of Rancholabrean age (late Pleistocene). The 5 Qa localities yielded *Bison bison antiquus* (extinct bison), *Equus*, *Mammut* (mastodon), and *Glossotherium* (ground sloth). Another 7 Pleistocene vertebrate localities are in the east-adjacent Altamont quadrangle. They yielded elements of the Rancholabrean fauna, including *Mammuthus columbi* (Columbian mammoth) and *Glossotherium harlani* (Harlan's ground sloth). For Alameda County, the UCMP database also lists two specimens from two Pliocene localities and 357 specimens from 45 Miocene localities; none are in Pleasanton and all are at least 10 miles from Spotorno Ranch.

**Remarks and Recommendations**

Hundreds of vertebrate fossils have been collected in Alameda County from Pleistocene alluvium and Miocene marine deposits; hence both are ranked as highly sensitive for significant paleontolgical resources. Those fossil occurrences in alluvium are usually unpredictable, however, because they tend to be scattered due to their post-mortem stream or floodwater transport and deposition. A preconstruction paleontological walkover of Spotorno Ranch is not recommended because the surface of the site is disturbed. Paleontological monitoring of project-related excavations is recommended due to the moderate to high sensitivity of the geological units. Should any significant paleontological resource (i.e., teeth or bones) be encountered, the construction crew should not attempt to remove them, which is likely to result in loss of data or specimen damage. Instead, construction activities should be diverted from the find until a professional paleontologist has evaluated it and, if confirmed as significant, properly recorded and salvaged it. Recovered fossils should then be deposited in an accredited and permanent scientific institution (e.g., UCMP) where they will be properly curated and preserved for the benefit of current and future generations.

Sincerely,

Reference Cited

Graymer, R.W., Jones, D.L., and Brabb, E.E., 1996, Preliminary geologic map emphasizing bedrock formations in Alameda County, California: A digital database: U.S. Geological Survey Open-File Report 96-252.

# Neogene Vertebrate Fossils from Alameda County

* denotes published specimen(s)

## PLEISTOCENE

Class Chondrichthyes (cartilaginous fish)
- *Myliobatus* (bat ray)

Class Actinopterygii (bony fish)
- *Acipenser* (sturgeon)
- *Archoplites interruptus* (Sacramento perch)
- *Orthodon microlepidotus* (Sacramento blackfish)
- *Gasterosteus aculeatus* (3-spined stickleback)
- *Catostomus occidentalis* (Sacramento sucker)

Class Amphibia (amphibians)
- *Ambystoma* (mole salamanders)
- *Aneides lugubris* (aboreal salamander)
- *Bufo* (toads)*
- *Rana* (common frogs)*
- *Scaphiopus* (southern spadefoot toad)
- *Taricha* (western newts)

Class Reptilia (reptiles)
- *Clemmys marmorata* (western pond turtle)
- *Crotalus* (rattlesnake)
- *Gerrhonotus coeruleus* (alligator lizard)
- *Lampropeltis* (king snake)
- *Phrynosoma* (horned lizard)
- *Pituophis melanoleucus* (San Diego gopher snake
- *Thamnophis* (garter snake)
- *Uta* (sideblotched lizard)

Class Aves (birds)
- *Aechmophorus occidentalis* (western grebe)
- *Anas acuta* (pintail duck)
- *Anas platyrhynchos* (mallard duck)
- *Branta canadensis* (Canadian goose)*
- Meleagridinae (turkey)
- *Neophrontops americanus* (extinct vulture)*

Class Mammalia (mammals)

Order Insectivora (insectivores)
- *Scapanus latimanus* (broad-footed mole)*
- *Sorex* (ornate shrew)

Order Xenartha (ground sloths)
- *Glossotherium harlani* (Harlan's ground sloth)
- *Megalonyx* (flat-footed ground sloth)

Order Lagomorpha (rabbits & hares)
- *Sylvilagus* (cottontail rabbit)
- *Lepus* (jackrabbit)

Order Rodentia (rodents)
- *Dipodomys* (kangaroo rat)
- *Microtus californicus* (California meadow vole)
- *Neotoma fuscipes* (dusky-footed wood rat)
- *Perognathus* (pocket mouse)
- *Peromyscus boylii* (brush mouse)
- *Peromyscus californicus* (California deer mouse)
- *Peromyscus maniculatus* (white-footed mouse)
- *Peromyscus truei* (pinyon mouse)
- *Reithrodontomys raviventris* (saltmarsh harvest mouse
- *Sciurus* (squirrel)
- *Spermophilus beecheyi* (California ground squirrel)
- *Spermophilus bensoni* (Benson ground squirrel)
- *Thomomys bottae* (Botta's pocket gopher)*

Order Carnivora (carnivores)
- *Arctodus* (short-faced bear)
- *Canis dirus* (dire wolf)*
- *Canis latrans* (coyote)*
- *Canis priscolatrans* (small wolf)*
- *Cynodesmus thooides* (extinct canid)
- *Dinobastis* (sabre-toothed cat)*
- *Enhydra lutris* (sea otter)
- *Taxidea* (badger)
- *Felis* (bobcat)
- Pinnipedia (seals, sea lions)
- *Smilodon* (sabre-toothed cat)
- *Vulpes macrotis* (kit fox)*

Order Proboscidea (elephants)
- *Mammut americanum* (American mastodon)
- *Mammuthus columbi* (Columbian mammoth)*

Order Perissodactyla (odd-toed ungulates)
- *Equus caballus* (modern horse)*
- *Equus pacificus* (Pacific horse)
- *Pliohippus interpolatus* (Pliocene horse)
- *Tapirus* (tapir)

Order Artiodactyla (even-toed ungulates)
- *Antilocapra pacifica* (Pacific pronghorn)
- *Bison bison antiquus* (ancient bison)
- *Bison latifrons* (long-horned bison)
- *Bison priscus* (steppe bison)
- *Camelops minidokae* (Minidoka camel)
- *Camelops* (extinct large camel)
- *Capromeryx minor* (diminutive pronghorn)
- *Cervus* (deer, elk)
- *Euceratherium collinum* (shrub-ox)
- *Hemiauchenia* (long-legged llama)*
- *Odocoileus* (mule & white-tailed deer)
- *Platygonus* (large peccary)
- *Sphenophalos* (pronghorn)
- *Tetrameryx* (4-horned deer)*

Order Chiroptera (bats)

## PLIOCENE

Class Actinopterygii (bony fish)
    *Scombridae* (mackerels, tuna, bonitos)
Class Mammalia (mammals)

## MIOCENE

Class Chondrichthyes (cartilaginous fish)
    Selachimorpha (sharks)
Class Actinopterygii (bony fish)
    *Scombridae* (mackerels, tuna, bonitos)
Class Mammalia (mammals)
  Order Lagomorpha (rabbits & hares)
    *Hypolagus* (extinct rabbit)
  Order Carnivora (carnivores)
    *Allodesmus* (extinct pinniped)
    *Kampholophos serrulus** (extinct dolphin)
  Order Proboscidea (elephants)
    *Gomphotherium* (mastodon)
    *Mammut americanum* (American mastodon)
  Order Perissodactyla (odd-toed ungulates)
    *Desmostylus hesperus** (extinct sea cow)
    *Hipparion* cf. *H. mohavense** (Mohave 3-toed horse)
    *Nannippus tehonensis** (Tejon horse)
    *Pliohippus* cf. *P. leardi** (primitive one-toed horse)
    *Pliohippus* cf. *P. tehonensis* (primitive one-toed horse)

# Appendix E:
# Engeo Geotechnical Feasibility Report

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Project No.
**06103.200.000**

June 7, 2018

Mr. Mike O'Hara
TL Partners I, LP
3500 Douglas Blvd., Suite 270
Roseville, CA 95661

Subject: Spotorno Property
Pleasanton, California

**APPROPRIATENESS OF GEOTECHNICAL FEASIBILITY REPORT**

Reference: ENGEO; "Geotechnical Feasibility Report, Spotorno Property;" Project No. 6103.200.000; January 9, 2015.

Dear Mr. O'Hara:

At your request, we prepared this letter regarding the appropriateness of the referenced preliminary geotechnical report for the Spotorno Property in Pleasanton, California. We prepared the referenced report in 2015. The purpose of the referenced report was to provide a description of the likely geotechnical hazards at the site and typical mitigations for the purpose of project planning and determination of feasibility of development. Since the time of writing this report, there have been changes to the building code but the typical methods of evaluation of geotechnical hazards have not materially changed since the issuance of the report. This report is still appropriate to use for the original intention.

We recommend that prior to construction, a design report be prepared. That report should include explorations as described in Section 5.13 of the referenced report and should be prepared in accordance with Building Code that is current at the time of design.

If you have any questions or comments regarding this letter, please call and we will be glad to discuss them with you.

Sincerely,

ENGEO Incorporated

REGISTERED PROFESSIONAL ENGINEER
JEFFREY A. FIPPIN
No. 2631
GEOTECHNICAL
STATE OF CALIFORNIA

Jeff Fippin, GE

Steve Harris, GE

jf/sh/dt

ENGEO
– Expect Excellence

GEOTECHNICAL
ENVIRONMENTAL
WATER RESOURCES
CONSTRUCTION SERVICES

Project No.
**6103.200.000**

January 9, 2015

Mr. Mike O'Hara
Tim Lewis Communities
Suite 270
Roseville, CA 95661

Subject: Spotorno Property
Pleasanton, California

## GEOTECHNICAL FEASIBILITY REPORT

Dear Mr. O'Hara:

We prepared this geotechnical feasibility report for the proposed residential development at the approximately 112-acre site referred to as the Spotorno Property. The subject property is located at 1000 Minnie Street in Pleasanton, California and is identified as Assessor Parcel Number (APN) 949-16-6. This report is prepared as outlined in our proposal dated December 29, 2014.

The accompanying report contains a summary of our document review, conclusions, and preliminary recommendations for the geotechnical aspects of the proposed development on the subject site. Based on our study, it is our opinion that the proposed development is feasible from a geotechnical standpoint provided the preliminary recommendations included in this report are incorporated into project planning and development.

We are pleased to be of service to you on this project and look forward to consulting further with you and your design team.

Sincerely,

ENGEO Incorporated

REGISTERED PROFESSIONAL ENGINEER
RANDY HILDEBRANT
No. 79940
Exp. 9/30/2016
CIVIL
STATE OF CALIFORNIA

Randy Hildebrant, PE

REGISTERED PROFESSIONAL ENGINEER
JEFFREY A. FIPPIN
No. 2631
Exp. 6/30/2015
GEOTECHNICAL
STATE OF CALIFORNIA

Jeff Fippin, GE

Phil Stuecheli, CEG
rh/jf/ps/bvv

# 1.0 INTRODUCTION

## 1.1 PURPOSE AND SCOPE

We prepared this geotechnical feasibility report for the proposed residential development at the subject site in Pleasanton, California. This report was prepared as outlined in our proposal dated December 29, 2014. Tim Lewis Communities authorized us to conduct the proposed scope of services, which included the following:

- Review of published geologic maps, previous geotechnical studies, and pre-development historical maps and aerial photographs for the site and adjacent to the site.
- Site reconnaissance visit to observe existing site conditions and perform preliminary geologic mapping of the site.
- Preparation of a report providing our preliminary findings and conclusions regarding the geotechnical aspects and feasibility of the project.

This report was prepared for the exclusive use of Tim Lewis Communities and their consultants for project planning and design. In the event that any changes are made in the character, design or layout of the development, we must be contacted to review the conclusions and recommendations contained in this report to determine whether modifications are necessary.

## 1.2 SITE LOCATION AND PROJECT DESCRIPTION

The study area is located east of Alisal Street and north of Westbridge Lane at 1000 Minnie Street in Pleasanton, California (Figure 1 and Figure 2) and is identified as Assessor Parcel Number (APN) 949-16-6. The study area has an irregular footprint that encompasses approximately 112 acres and consists of undeveloped land currently used for livestock pasture. It is our understanding that the proposed improvements consist of detached residential structures located on the western, relatively flat, portion of the property with open space consisting of hillsides planned in the eastern portions of the site. According to an Aerial Exhibit by Ruggeri Jensen Azar (RJA) dated December 19, 2014, the improvements are intended to be west of the approximate limit of a 25-percent slope. Based on information from RJA, cuts and fills 15 to 25 feet, respectively, are anticipated.

The highest elevation on the project area is approximately 683 feet near the top of a hill in the eastern portion of the study area and the lowest elevation is approximately 384 feet in the western end of the flatland area adjacent to Alisal Street.

## 1.3 PREVIOUS EXPLORATIONS

We previously performed a geotechnical exploration of the study area in 2004 including drilling and logging borings ranging in depth from about 11 to 20 feet below the existing ground surface and excavating and logging of 12 tests pits ranging from 5 to 16 feet deep. The proposed development at the time of our 2004 study included a by-pass road with 120 feet high cut slopes at gradients 3:1 (horizontal:vertical) and fill slopes up to 60 feet high at gradients 2½:1. The lower western portion was to be developed into 97 single-family lots.

We issued a revised report in 2008 utilizing previously collected data. The development plan was altered to 79 single-family lots with cuts and fills up to 15 feet with slopes between lots ranging up to 17 feet high with additional retaining walls.

Prior to our work, the study area was explored by Terrasearch as published in a fault study dated November 24, 1998, preliminary geotechnical investigation report dated March 18, 1999, and a geotechnical investigation report dated September 10, 1999. Terrasearch performed various field explorations including borings, tests pits, and rock cores. Prior to Terrasearch, Berlogar Geotechnical Consultants (BGC) performed a geologic reconnaissance as published in their report dated May 22, 1997. BGC's field exploration consisted of a field visit by an engineering geologist.

Known previous explorations located near and within the proposed area to be developed are shown in Figure 2.

# 2.0 GEOLOGY AND SEISMICITY

### 2.1.1 Regional Geology

The site is located within the Coast Ranges physiographic province of California. The Coast Ranges physiographic province is typified by a system of northwest-trending, fault-bounded mountain ranges and intervening alluvial valleys.

Bedrock in the Coast Ranges consists of igneous, metamorphic and sedimentary rocks that range in age from Jurassic to Pleistocene. The present physiography and geology of the Coast Ranges are the result of deformation and deposition along the tectonic boundary between the North American plate and the Pacific plate. Plate boundary fault movements are largely concentrated along the well-known fault zones, which in the area include the San Andreas, Hayward, and Calaveras faults, as well as other lesser-order faults.

### 2.1.2 Site Geology and Seismicity

Published geologic maps of the vicinity (Graymer, et al, 1996; Dibblee, 1980) map bedrock in the study area to be Pliocene to Pleistocene Livermore gravels (QTl), as shown in Figure 3. The Livermore gravels generally consist of stream terrace deposits of weakly consolidated, poorly sorted

siltstone, sandstone and conglomerate. The Livermore gravels are mapped with a gentle (15 to 25 degrees) northeasterly dip. Alluvium (Qa), colluvium (Qc), and landslide deposits (Qls) are also mapped (Nilsen, 1975) in several locations within the study area, as shown on Figure 3.

The study area is located within a State of California Earthquake Fault Hazard Zone for the Verona Fault, which crosses the site adjacent to the 25-percent slope limit (Figure 6). The Calaveras and Las Positas faults are located approximately 2 miles southwest and 4 miles east of the study area, respectively. The Greenville fault is located approximately 10 miles to the east. The Hayward fault is located approximately 7¾ miles to the southwest. The San Andreas fault is located approximately 27 miles to the southwest. Each of these faults has produced earthquakes within the last 200 years.

The maximum earthquake for the region can be expected from the San Andreas fault, the major active fault within the Bay Area. Maximum earthquakes in the Moment Magnitude 6 to 7 range can be expected from the Hayward, Calaveras and Concord faults. The Greenville fault has been assigned a maximum Moment Magnitude of approximately 6.9. Figure 7 shows the study area in relation to the faults discussed. In general, the study area is located within a seismically active area.

The Uniform California Earthquake Rupture Forecast (UCERF, 2008) evaluated the 30-year probability of a Moment Magnitude 6.7 or greater earthquake occurring on the known active fault systems in the Bay Area, including the Calaveras fault. The UCERF generated an overall probability of 63 percent for the Bay Area as a whole, a probability of 31 percent for the Hayward fault, 7 percent for the Calaveras fault, and 3 percent for the Concord-Green Valley fault.

#### 2.1.2.1 Artificial Fill

Based on our reconnaissance of the study area, it appears that past grading was limited to the construction of the dirt roads. Existing fill associated with the previous grading appears to be less than 3 to 4 feet thick and is located in the northern section of the study area and beyond the 25-percent slope limit.

#### 2.1.2.2 Landslides

Regional landslide mapping of the vicinity by Nilsen (1975) (Figure 4) and by Majmundar (1991) shows numerous landslides within the study area.

We used black and white stereo-paired aerial photographs for the purpose of observing natural landforms in the study area. These photographs were used to study geomorphic features, interpret the relationships between landforms and the underlying rock, soil, and geologic structures and observe the presence, character, and activity of suspected slope failures on or adjacent to the study area. Based on our examination of aerial photographs, four possible landslide areas were identified on the southwestern portion of the study area near the 25-percent

slope limit (identified as "L-1" through "L-4" on Figure 2). The four possible landslides were identified based on relatively subtle breaks in slope along spur ridges that may be indicative of landslides.

Test pits were previously excavated near the suspected head scarps and toes of two of the possible landslides. Evidence of landslides was observed in the test pits (Appendix A, TP-1 and TP-2 and Appendix B Terrasearch, TP-15 and TP-16). We previously observed drilling of two borings in the lower portion of the large mapped landslide in the central portion of the study area. The borings were drilled using hollow-stem augers and were sampled from about 3 to 25 feet deep using an interval drive sample method. Generally, landslide deposits encountered in the test pits and borings consisted of dark gray, very stiff to hard, silty clay 12 to 14 feet deep overlying several feet of light brown, moist to saturated, soft to stiff sandy clay, overlying poorly to unconsolidated, thinly bedded, friable to weak claystone, siltstone, or sandstone of the Livermore gravel formation. Shearing or other evidence of a landslide slip surface was limited to a sharp, sub-horizontal, soil/bedrock contact encountered in TP-1. Landslide deposits were encountered up to 20 feet thick in landslide area L-4 (Terrasearch TP-16). Findings of the test pits and borings indicate that the landslide areas appear to closely match landslide areas identified through regional mapping and aerial photograph review.

#### 2.1.2.3 Residual Soil

In the upland areas of the study area, bedrock is capped with a relatively thin layer of residual soil, soil that develops essentially in-place from weathering of the underlying parent material. The United States Department of Agriculture maps residual soil as Linne clay loam having strongly calcareous and slightly plastic characteristics. Residual soil encountered at the study area consists predominately of dark brown, silty or sandy clay. The residual soil appears to be dry and hard without significant porosity. Based on visual examination, residual soil appeared to have moderate to high plasticity and may be highly expansive.

#### 2.1.2.4 Colluvium

Regional mapping of surficial deposits in the vicinity by Nilsen (1975) shows much of the base of the west facing slope near the center of the study area to be underlain by colluvium (Figure 4). Colluvial deposits were found to range from silty clay to sandy clay with some fine gravel. The colluvial deposits were typically dark brown, very stiff to hard and varied from dry to moist. Based on the findings of our exploration and data by others, the colluvium appears to range up to about 16 feet in thickness (Terrasearch, 1998, TP-19).

#### 2.1.2.5 Alluvium

The USDA maps alluvial topsoil in the study area as Rincon loam having neutral to mild alkalinity and very plastic characteristics and Pleasanton gravelly loam in the southern portion of the study area consisting of alluvium derived from sandstone and shale. Alluvial materials (Qal) consisting of relatively young, unconsolidated stream deposits were encountered in the borings

(Appendix A, B-1 through B-6) on the relatively flat western portion of the study area. Alluvial soils encountered were generally found to consist of silty or sandy clay with some gravel and minor layers of clayey sand and gravel. The alluvium encountered was primarily medium stiff to hard clay with some medium dense to dense silty or clayey sand and ranged in thickness up to about 18 feet. Laboratory tests on surficial soils in the alluvium resulted in Plasticity Indices (PI) as follows: Boring B-3 at 5 feet, PI = 14; Boring B-4 at 2 feet, PI = 29, and; Boring B-5 at 4 feet, PI = 33. The laboratory test results indicate that the surficial soils have low to high plasticity and corresponding moderate to high expansion potential.

#### 2.1.2.6 Livermore Gravels

Portions of the study area underlain by Livermore Gravels at relatively shallow depths are indicated on the Geologic Map (Figure 3) using the symbol QTl. Where encountered in test pits and borings, the Livermore gravels were found to consist predominantly of light olive-gray and olive-brown siltstone and sandstone with some interbedded light olive-gray conglomerate. The bedrock encountered was friable to weak, and varied from thinly to thickly bedded. A few test pits encountered slightly cemented siltstone that was moderately difficult to excavate with the small excavator used for our exploration.

Bedrock structure noted in the test pits was striking generally northwest with dips ranging from 10 to 30 degrees to the northeast. Some beds at lower elevations were striking in a more northerly to northeasterly direction and had steeper dip angles ranging up to 50 degrees. Bedding planes appeared to be poorly developed and/or gradational.

#### 2.1.2.7 Groundwater

Groundwater was encountered in Borings B-1, B-2, B-3 and B-8 drilled for this investigation at depths of 10, 12, 13½, and 19 feet, respectively. Groundwater was encountered in Test Pit TP-1 at a depth of about 12 feet and could be characterized as a strong seep from a thin, unconsolidated, "clean" sandstone bed. This groundwater could be a localized occurrence of shallow groundwater manifested by the presence of the Verona fault behaving as a groundwater barrier.

Terrasearch reported that groundwater was initially encountered in the lower-lying portion of the study area at depths ranging from 13 to 20 feet deep at the southwest end to 15 feet on the eastern side. A few hours after drilling, the groundwater rose to a depth of 2 feet in Boring 1 and gradually became deeper in other borings toward the eastern end of the study area up to a depth of 11 feet.

Groundwater levels should be expected to vary, depending on weather conditions and the time of year.

# 3.0 SITE RECONNAISSANCE

We conducted a site reconnaissance on Tuesday, January 6, 2015. From our review of existing information, we conducted our site reconnaissance with a focus on ground conditions and slope stability. Due to soft ground conditions, we limited our site reconnaissance to the area generally to the west of the 25-percent slope limit. It appeared that the upper foot of ground was generally soft from the recent rains and years of disking. We observed native soil at the ground surface in the relatively flat areas and grasses covering the hillsides. We observed surface evidence of the landslides previously identified and shown on Figure 2 near the 25-percent limit. It appears that the site conditions in the area generally west of the 25-percent limit line are similar to the our previous 2004 and 2008 study.

## 3.1 GROUNDWATER

No groundwater seepage or other indication of near surface groundwater was observed during our reconnaissance. Fluctuations in groundwater levels occur seasonally and over a period of years because of variations in precipitation, temperature, irrigation, or other factors.

# 4.0 CONCLUSIONS AND PRELIMINARY RECOMMENDATIONS

From a geologic and geotechnical standpoint, the study area is generally suitable for the proposed development, provided that the preliminary recommendations included in this report, along with other sound engineering practices, are incorporated in the design and construction of the project. The primary geologic and geotechnical considerations for this project are:

- Slope stability of the west facing slope at the southern portion of the site.
- Considerable ground shaking from an earthquake of moderate to high magnitude generated within the San Francisco Bay Region.
- Potential for fault rupture.
- Moderately to highly expansive soil.

## 4.1 LANDSLIDES AND SLOPE STABILITY

As previously discussed, landslides have been mapped throughout the study area. It is our understanding that the improvements are proposed on the western relatively flat portion of the property as delineated by the 25-percent. Four landslides have been identified along the eastern boundary of the proposed improvement area as shown on Figure 2. It does not appear that structures will be located on slide areas, however, structures could be located near the toe of the landslides risking damage to the structure. Recommendations for mitigation of this hazard should be provided in a design-level exploration for the proposed project pending the site plan. We provide the preliminary mitigation option of removal and replacement as engineered fill in

Section 5.5. Other options include avoidance of the area by revising the land plan or construction of a structural wall to protect upslope areas.

## 4.2 SEISMIC HAZARDS

Potential seismic hazards resulting from a nearby moderate to major earthquake can generally be classified as primary and secondary. The primary effect is ground rupture, also called surface faulting. The common secondary seismic hazards include ground shaking, ground lurching, and liquefaction. The following sections present a discussion of these hazards as they apply to the site.

### 4.2.1 Ground Rupture

In 1998, Terrasearch, Inc. conducted a supplemental fault investigation on the Verona Fault within the study area. Three fault trenches were excavated across the fault trace previously identified by literature review, aerial photograph interpretation and geophysical surveys. A fault zone, approximately 100 to 130 feet wide, was encountered in the trenches. The location of the fault zone is depicted on Figure 2. We concur with the findings developed by Terrasearch and recommend the establishment of a "Building Restriction Zone" that extends to 50 feet on both sides of the fault zone. We recommend that buildings for residential use not be located within this "Building Restriction Zone."

### 4.2.2 Ground Shaking

An earthquake of moderate to high magnitude generated within the San Francisco Bay Region could cause considerable ground shaking at the site, similar to that which has occurred in the past. To mitigate the shaking effects, all structures should be designed using sound engineering judgment and the latest California Building Code (CBC) requirements, as a minimum.

### 4.2.3 Liquefaction

The site is not located within a State of California Seismic Hazard Zone (CGS, 2008) for areas that may be susceptible to liquefaction (Figure 5). In addition, the United States Geological Survey (USGS) has mapped the area to have low susceptibility for liquefaction. Soil liquefaction results from loss of strength during cyclic loading, such as imposed by earthquakes. Soils most susceptible to liquefaction are clean, loose, saturated, uniformly graded, sand. Empirical evidence indicates that loose to medium dense gravel, silty sand, low-plasticity silt, and some low-plasticity clay are also potentially liquefiable.

The alluvial deposits encountered in explorations previously performed in the study area were generally found to be stiff sandy, gravelly clay with lenses of medium dense to dense clayey sand and gravel. According to the previous explorations, granular layers were generally less than three feet thick. Bedrock was encountered less than approximately 20 feet deep. Based on this information, it is our opinion that the potential for liquefaction is not a significant risk to the

proposed improvements and will likely result in ground surface settlement 2 inches or less. We preliminarily recommend that building foundation design consider the potential for up to 1 inch of differential settlement due to extreme earthquake-induced liquefaction in design. This differential settlement should be assumed occur over a distance of approximately 50 feet.

### 4.2.4 Lateral Spreading

Lateral spreading is lateral displacement of sloping ground as a result of pore pressure buildup or liquefaction in a shallow, underlying soil deposit during an earthquake. Lateral spreading, as a result of liquefaction, occurs when a soil mass slides laterally on a liquefied layer, and gravitational and inertial forces cause the layer and the overlying non-liquefied material to move in a downslope direction. The magnitude of lateral spreading movements depends on earthquake magnitude, distance between the site and the seismic event, thickness of the liquefied layer, ground slope or ratio of free-face height to distance between the free face and structure, fines content, average particle size of the materials comprising the liquefied layer, and the density of the soil materials. Due the lack of significant free-faces and limited amount of potentially liquefiable material, it is our opinion that the risk of lateral spread is low.

### 4.2.5 Earthquake-Induced Landslides

Ground shaking associated with earthquake events can trigger landslides in weak geologic materials, caused by a wide range of mechanisms. Due to the presence of a landslides in the study area, especially near the 25-percent slop limit, the potential for earthquake-induced landslides is considered high. This geologic hazard can be mitigated by various methods including but not limited to removal of potentially unstable materials and replacement as engineered fill or construction of engineered fill buttresses.

## 4.3 EXPANSIVE SOIL

Expansive soil can shrink and swell as a result of moisture changes. This can cause heaving and cracking of slabs-on-grade, pavements, and structures founded on shallow foundations. Structures can be supported on structural reinforced mat foundations that are designed to accommodate shrinking and swelling subgrade soils.

Successful construction on expansive soil requires special attention during grading. It is imperative to keep exposed soil moist by occasional sprinkling. If the soil dries, it is extremely difficult to remoisturize the soil (because of their clayey nature) without excavation, moisture conditioning, and recompaction.

Conventional grading operations, incorporating fill placement specifications tailored to the expansive characteristics of the soil, and use of a mat foundation (either post-tensioned or conventionally reinforced) are common, generally cost-effective measures to address the expansive potential of the foundation soils. Based upon our initial findings, the effects of expansive soil are expected to pose a low impact when properly mitigated.

### 4.4 CORROSION POTENTIAL

An evaluation of possible corrosion impacts to study area improvements has not been conducted to date. We recommend that corrosion testing be conducted on the subgrade soil of the final building pads prior to building and utility construction. Clay soil typically has a low resistivity resulting in corrosion to buried metal in direct contact with the soil. Corrosion mitigation of buried metal, such as metallic pipes, will likely be necessary.

### 4.5 FLOODING

The Federal Emergency Management Agency has not yet mapped the study area for flood risk, the Civil Engineer should review pertinent information relating to possible flood levels for the subject site based on final pad elevations and provide appropriate design measures for development of the project, if recommended.

## 5.0 PRELIMINARY SITE RECOMMENDATIONS

The following preliminary recommendations are for initial land planning and preliminary estimating purposes. Final recommendations regarding site grading and foundation construction will be provided after additional design level geotechnical exploration has been undertaken.

### 5.1 GENERAL SITE CLEARING

Clear areas to be developed of all surface and subsurface deleterious materials including buried utility and irrigation lines, debris, and designated trees, shrubs, and associated roots. Clean and backfill excavations extending below the planned finished site grades with suitable material compacted to the recommendations presented in Section 5.8. Retain ENGEO to observe and test all backfilling.

Based on the vegetation observed at the time this report was prepared, we recommend stripping the site to remove surface organic materials, following clearing. Strip organics from the ground surface to a depth of at least 2 to 3 inches below the surface. Remove strippings from the site or, if considered suitable by the landscape architect and owner, use them in landscape fill. Depending on the specific vegetation conditions that exist at the time of grading, alternative recommendations for mowing and/or disking the site can be considered by the Geotechnical Engineer.

#### 5.1.1 Demolition and Stripping

Site development should commence with the removal of and improvements and their foundations, and buried structures including abandoned utilities and their backfill. All debris or soft compressible soils should be removed from any location to be graded, from areas to receive fill or structures, and from those areas to serve as borrow. The depth of removal of such materials should be determined by the Geotechnical Engineer in the field at the time of grading.

Existing vegetation and any pavement (asphalt concrete/concrete and underlying aggregate base) should be removed from areas to receive fill, or structures, or those areas to serve for borrow. Tree roots should be removed down to a depth of at least 3 feet below existing grade. The actual depths of tree root removal should be determined by the Geotechnical Engineer's representative in the field. Subject to approval by the Landscape Architect, strippings and organically contaminated soils can be used in landscape areas. Otherwise, such soils should be removed from the study areas. Any topsoil that will be retained for future use in landscape areas should be stockpiled in areas where it will not interfere with grading operations.

All excavations from demolition and stripping below design grades should be cleaned to a firm undisturbed soil surface determined by the Geotechnical Engineer. This surface should then be scarified, moisture conditioned, and backfilled with compacted engineered fill. The requirements for backfill materials and placement operations are the same as for engineered fill.

No loose or uncontrolled backfilling of depressions resulting from demolition and stripping is permitted.

## 5.2 COLLUVIUM AND LANDSLIDE REMOVALS

We recommend removal of all existing colluvium and landslide debris within the development limit and within the west facing slope located near the 25-percent slope limit. Figure 8 and Figure 9 show cross-sections of the landslide with approximate removal areas.

## 5.3 ACCEPTABLE FILL

Onsite soil and rock material is suitable as fill material provided it is processed to remove concentrations of organic material, debris, and particles greater than 8 inches in maximum dimension.

## 5.4 SLOPES

### 5.4.1 Gradients

For planning purposes, slope gradients for proposed graded slopes should not be steeper than 3:1 (horizontal:vertical); slopes inclined steeper than 3:1 will require special evaluation and may require geogrid reinforcement. In addition, cut slopes may require reconstruction of the exposed slope as engineered fill if adverse conditions are encountered during excavation. The contractor is responsible to construct temporary construction slopes in accordance with CAL-OSHA requirements.

### 5.4.2 Fill Placed on Existing Slopes

We recommend keying and benching where fill is placed on original grade with a gradient of 6:1 or steeper. The contractor should do the following when keying and benching fill on existing slopes.

Construct a minimum 24-foot-wide keyway inward from the toe of the new fill slope as shown on Figure 10. Extend the keyway at least 3 feet below original grade into firm competent soil/rock, as determined in the field by the representative of the Geotechnical Engineer. Slope the keyway bottom at least 2 percent downward toward the heel of the keyway. Deeper keyways may be required based on actual soil/rock conditions observed during construction.

Cut benches into original grade after the keyway has been nearly filled with compacted engineered fill. Construct benches into original slope grade as filling proceeds every 2 feet vertically, to remove loose soil/rock. Deeper bench depths may be required depending on actual conditions observed during construction. Bench widths will vary depending on the original slope grade and actual bench depth.

### 5.4.3 Slope Setbacks

For planning purposes we recommend that buildings be set back from the top of slope in accordance with CBC requirements (a minimum of 1/3 the height of the slope or a maximum of 40 feet). Alternatively, deep foundations such as pier-and-grade-beam foundations should be anticipated for buildings close to the top of slopes.

## 5.5 CUT/FILL TRANSITION OR CUT LOTS

Building pads constructed in cut may encounter variably expansive subsurface conditions in the near-surface soil and rock; these pads may therefore be subject to damaging differential soil movements. Building pads that transition from cut to fill within the building pad area also can experience differential soil movements.

We recommend such building pads be reconstructed to create uniform subgrade conditions. This can be accomplished by subexcavating the soil on the building pads to a minimum depth of 2 feet below finished pad grade on cut lots or lots constructed over cut-and-fill transitions and replacing the subexcavated material with uniformly mixed compacted fill. The subexcavation should be performed over the entire flat pad area. We present overexcavation recommendations in Figure 11 to mitigate the effects of differential materials located under a structure.

## 5.6 DIFFERENTIAL FILL THICKNESS

Differential building movements may result from conditions where building pads have significant differentials in fill thickness. We recommend that the differential fill thickness across

any lot be no greater than 10 feet. Local subexcavation of soil material and replacement with compacted fill may be needed to achieve this recommendation.

## 5.7 FILL PLACEMENT

For land planning and cost estimating purposes, the following compaction control requirements should be anticipated for general fill areas:

| | |
|---|---|
| Test Procedures: | ASTM D-1557. |
| Required Moisture Content: | Not less than 4 percentage points above optimum moisture content. |
| Minimum Relative Compaction: | Not less than 90 percent relative compaction. |

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same material.

Additional compaction requirements may be required for near-surface building pad foundation soils and retaining wall backfill soils. These additional requirements will be developed during our detailed exploration.

## 5.8 STATIC AND PERCHED GROUNDWATER

Based on the previous data, it appears that the static groundwater level beneath the study areas could affect proposed development. The highest groundwater elevation recorded was approximately 2 feet below the existing grade. In addition to impacting the construction of underground utilities, shallow or perched water can:

1. Impede grading activities.

2. Cause moisture damage to sensitive floor coverings.

3. Transmit moisture vapor through slabs causing excessive mold/mildew build-up, fogging of windows, and damage to computers and other sensitive equipment.

4. Cause premature pavement failure if hydrostatic pressures build up beneath the section.

Due to a relatively high groundwater table, groundwater will likely be encountered during construction of some underground utilities. Temporary construction dewatering should be anticipated during these construction activities.

## 5.9 SITE DRAINAGE

### 5.9.1 Surface Drainage

The project civil engineer is responsible for designing surface drainage improvements. With regard to geotechnical engineering issues, we provide the following minimum recommendation for surface drainage.

1. Slope pavement areas a minimum of 1 percent towards drop inlets or other surface drainage devices.

2. Slope finished grade away from building exteriors at a minimum of 5 percent for a distance of at least 10 feet.

3. Discharge roof downspouts into closed conduits and direct away from buildings to appropriate drainage devices.

### 5.9.2 Subsurface Drainage

Subsurface drainage systems should be installed in all keyways and swales or natural drainage areas. In addition, lot subdrains should be installed at the toe of cut or fill slopes above residential lots.

We recommend that we be retained to review the grading plans and show the approximate locations of recommended subdrains on a remedial grading plan. Depending on the actual conditions encountered during grading, similar subsurface drainage facilities may be recommended within low-lying areas. Subrains should also be added where wet conditions are encountered during grading.

### 5.9.3 Stormwater Infiltration and Stormwater Bioretention Areas

Due to the density of the site soil and fines content (percentage passing the No. 200 sieve) generally exceeding 30 percent, the near-surface site soil is expected to have a low to moderate permeability value for stormwater infiltration in grassy swales or permeable pavers, unless subdrains are installed. Therefore, Best Management Practices should assume that limited stormwater infiltration will occur at the site.

If bioretention areas are implemented, we recommend that, when practical, they be planned a minimum of 5 feet away from structural site improvements, such as buildings, streets, retaining walls, and sidewalks/driveways. In addition, we recommend that bioretention areas not be located at the tops of slopes.

## 5.10 FOUNDATIONS DESIGN

Based on the soil data and the proposed building type, it is our opinion that the structures can be supported on structural mat foundations.

A minimum mat thickness of 10 to 12 inches should be anticipated for preliminary purposes. A maximum allowable bearing pressure of 1,000 psf for dead-plus-live loads, which may be increased by 1/3 when considering total loads including wind or seismic, could also be incorporated for initial design purposes.

## 5.11 PRELIMINARY BUILDING CODE SEISMIC DESIGN

We provide the 2013 CBC seismic design parameters in Table 3.9-1 below, which include design spectral response acceleration parameters based on the mapped Risk-Targeted Maximum Considered Earthquake ($MCE_R$) spectral response acceleration parameters.

**TABLE 5.11-1**
2013 CBC Seismic Design Parameters
Latitude: 37.63579° Longitude: -121.86809°

| Parameter | Value |
|---|---|
| Site Class | D |
| Mapped $MCE_R$ Spectral Response Acceleration at Short Periods, $S_S$ (g) | 2.06 |
| Mapped $MCE_R$ Spectral Response Acceleration at 1-second Period, $S_1$ (g) | 0.78 |
| Site Coefficient, $F_A$ | 1.00 |
| Site Coefficient, $F_V$ | 1.50 |
| $MCE_R$ Spectral Response Acceleration at Short Periods, $S_{MS}$ (g) | 2.06 |
| $MCE_R$ Spectral Response Acceleration at 1-second Period, $S_{M1}$ (g) | 1.18 |
| Design Spectral Response Acceleration at Short Periods, $S_{DS}$ (g) | 1.37 |
| Design Spectral Response Acceleration at 1-second Period, $S_{D1}$ (g) | 0.78 |
| $MCE_G$ Peak Ground Acceleration adjusted for Site Class effects, $PGA_M$ (g) | 0.79 |
| Long period transition-period, $T_L$ | 8 sec |

## 5.12 PRELIMINARY PAVEMENT DESIGN

The following preliminary pavement section has been determined for a Traffic Indices of 4 through 7, an assumed R-value of 5, and in accordance to the design methods contained in Chapter 630 of Caltrans Highway Design Manual.

**TABLE 5.12-1**
Preliminary Pavement Section

| Traffic Index | AC (inches) | AB (inches) |
|---|---|---|
| 4.0 | 2.5 | 8.0 |
| 5.0 | 3.0 | 10.0 |
| 6.0 | 3.5 | 13.0 |
| 7.0 | 4.0 | 16.0 |

Note: AC – Asphalt Concrete
AB – Caltrans Class 2 aggregate base (R-value of 78 or greater)

The above preliminary pavement section is provided for estimating only. We recommend the actual subgrade material should be tested for R-value and the Traffic Index and minimum pavement section(s) should be confirmed by the Civil Engineer and the City of Pleasanton.

### 5.13 ADDITIONAL RECOMMENDATIONS

Based upon our findings and assuming that the project proceeds into the next phase of development, additional geotechnical studies will be necessary. These studies will include:

- A geotechnical exploration and report for the proposed development. The site exploration should include both exploratory borings and test pits, as appropriate. The exploration is necessary to characterize site-specific subsurface conditions, collect soil samples for laboratory analysis, and determine site-specific recommendations for construction.

- A review of final construction plans and specifications, including grading plans, foundation plans and calculations for conformance with our recommendations.

Although these studies were not included in our current scope of services, we believe that they are important in expediting approval by governing agencies and achieving cost-effective construction. We will be pleased to provide an estimate for these additional services once final plans are available.

## 6.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

This report presents geotechnical recommendations for design of the improvements discussed in Section 1.3 for the development project. If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including but not limited to developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

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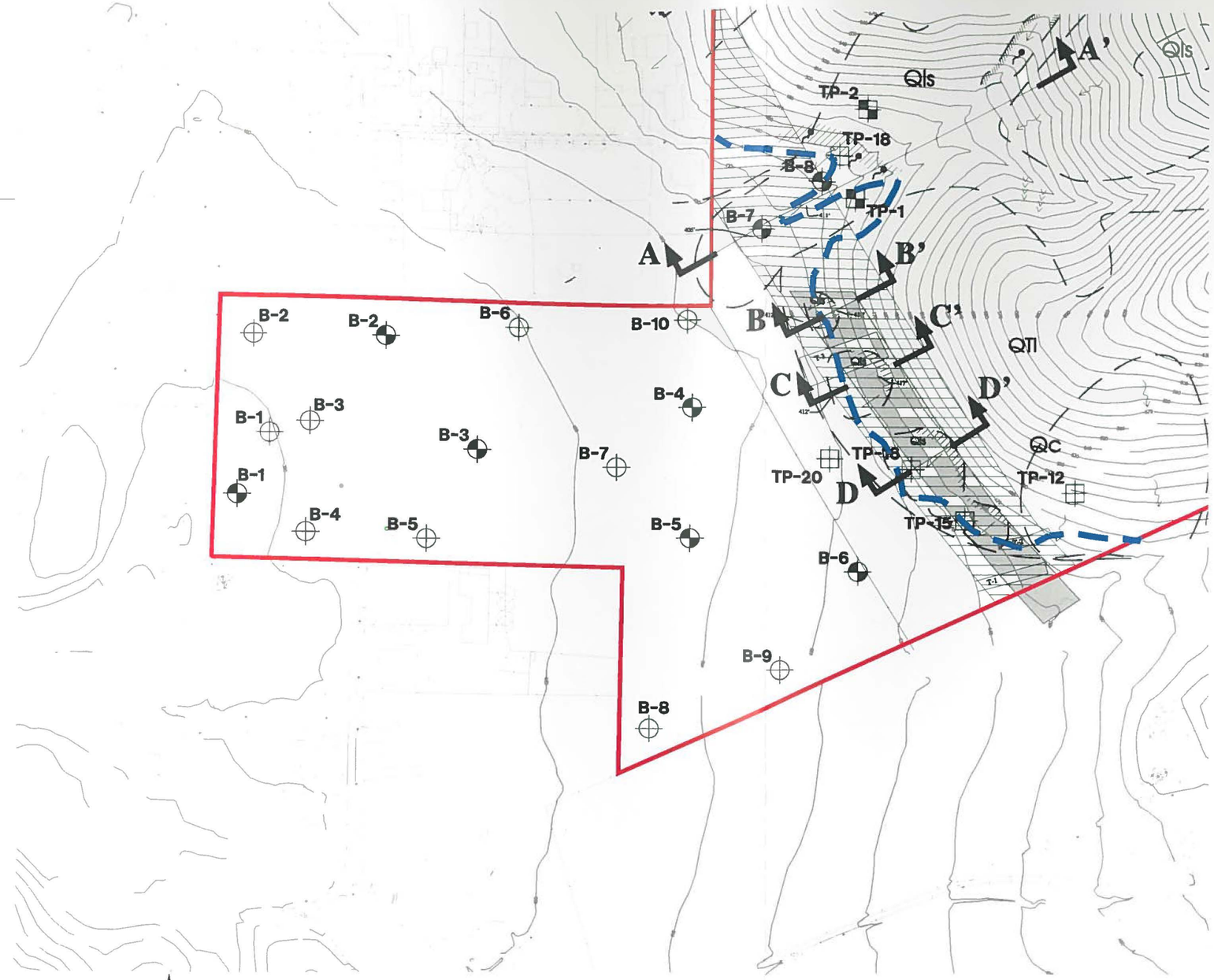
## EXPLANATION

*ALL LOCATIONS ARE APPROXIMATE*

- LIMIT OF 25% SLOPE
- GEOLOGIC CONTACT
- LANDSLIDE, HACHURES INDICATE SCARP LANDSLIDE AND COLLUVIUM AREA DESIGNATIONS ARE GIVEN)
- B-10 — BORING (ENGEO INCORPORATED, 2004)
- B-9 — BORING (TERRASEARCH INC., 1999)
- TP-33 — TEST PIT (TERRASEARCH, INC.)
- TP-12 — TEST PIT (ENGEO INCORPORATED, 2004) FAULT TRENCHES (TERRASEARCH INC., 1998)
- T-3 — FAULT TRENCHES (TERRASEARCH INC., 1998)
- FAULT ZONE (TERRASEARCH INC., 1998)
- BUILDING SETBACK ZONE
- Qal — ALLUVIUM
- Qc — COLLUVIUM
- Qls — LANDSLIDE DEBRIS
- QTl — LIVERMORE GRAVELS
- Qaf — ARTIFICAL FILL
- SPRING
- GULLY
- A A' — GEOLOGIC CROSS SECTION

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0 FEET 300
0 METERS 150

BASE MAP SOURCE: UNKNOWN

ENGEO Expect Excellence

SITE PLAN
SPOTORNO PROPERTY
DUBLIN, CALIFORNIA

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| PROJECT NO.: 6103.200.000 | FIGURE NO |
| SCALE: AS SHOWN | 2 |
| DRAWN BY: SRP / CHECKED BY: JF | |

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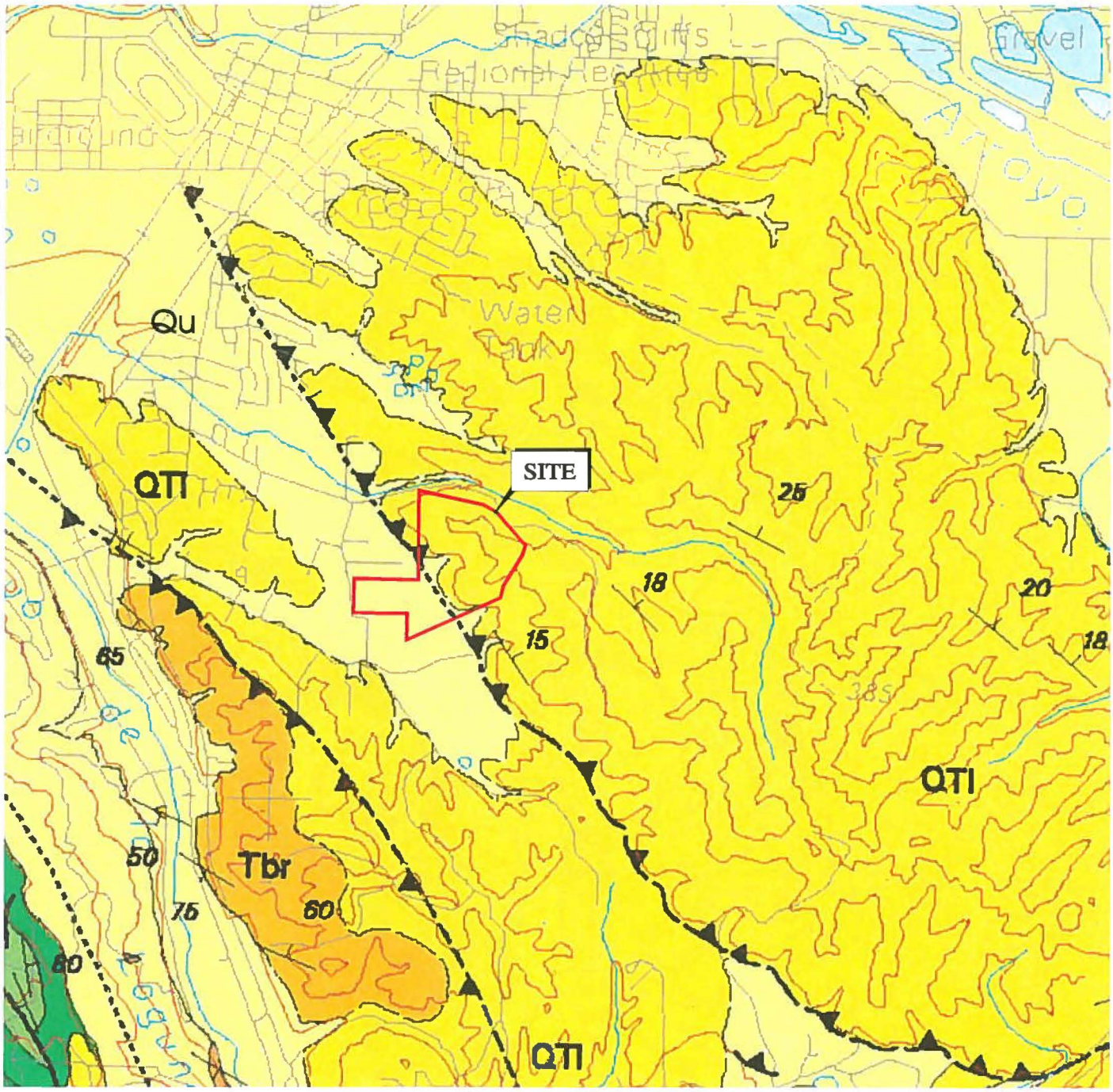


## EXPLANATION

*ALL LOCATIONS ARE APPROXIMATE*

| | |
|---|---|
| Qu | UNDIVIDED SURFICIAL DEPOSITS |
| QTl | LIVERMORE GRAVEL FORMATION |
| Tbr | BRIONES FORMATION |
| ▲ ▲ | OBLIQUE FAULT |
| 25 | STRIKE AND DIP OF BEDDING |

*BASE MAP SOURCE: GRAYMER, 1996*

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REGIONAL GEOLOGIC MAP
SPOTORNO PROPERTY
PLEASANTON, CALIFORNIA

| | | |
|---|---|---|
| PROJECT NO.: 6103.200.000 | | FIGURE NO. |
| SCALE: AS SHOWN | | 3 |
| DRAWN BY: SRP | CHECKED BY: JF | |

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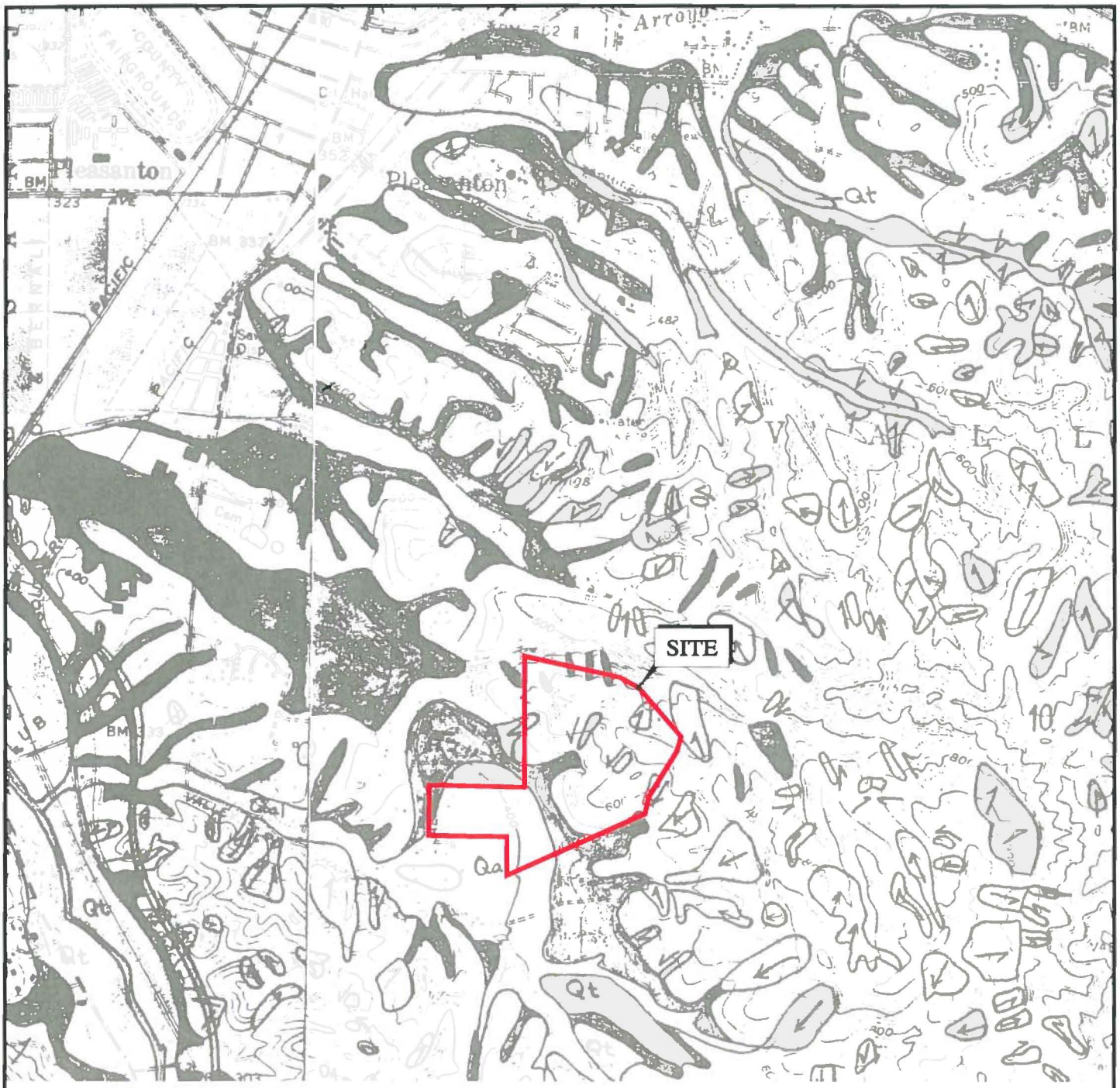


## EXPLANATION

*ALL LOCATIONS ARE APPROXIMATE*

N

0 FEET 2000.

0 METERS 1000

LANDSLIDE DEPOSIT. ARROWS INDICATE GENERAL DIRECTION OF DOWNSLOPE MOVEMENT. QUERIED WHERE UNCERTAIN

Qal ALLUVIAL DEPOSIT

Qt ALLUVIAL TERRACE DEPOSIT. QUERIED WHERE UNCERTAIN

COLLUVIAL DEPOSIT AND/OR SMALL ALLUVIAL FAN DEPOSIT

BEDROCK. QUERIED WHERE IDENTIFICATION UNCERTAIN

*BASE MAP SOURCE: NILSEN, 1975*

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REGIONAL SLOPE STABILITY

SPOTORNO PROPERTY

DUBLIN, CALIFORNIA

| | | |
|---|---|---|
| PROJECT NO.: 6103.200.000 | | FIGURE NO. |
| SCALE: AS SHOWN | | 4 |
| DRAWN BY: SRP | CHECKED BY: JF | |

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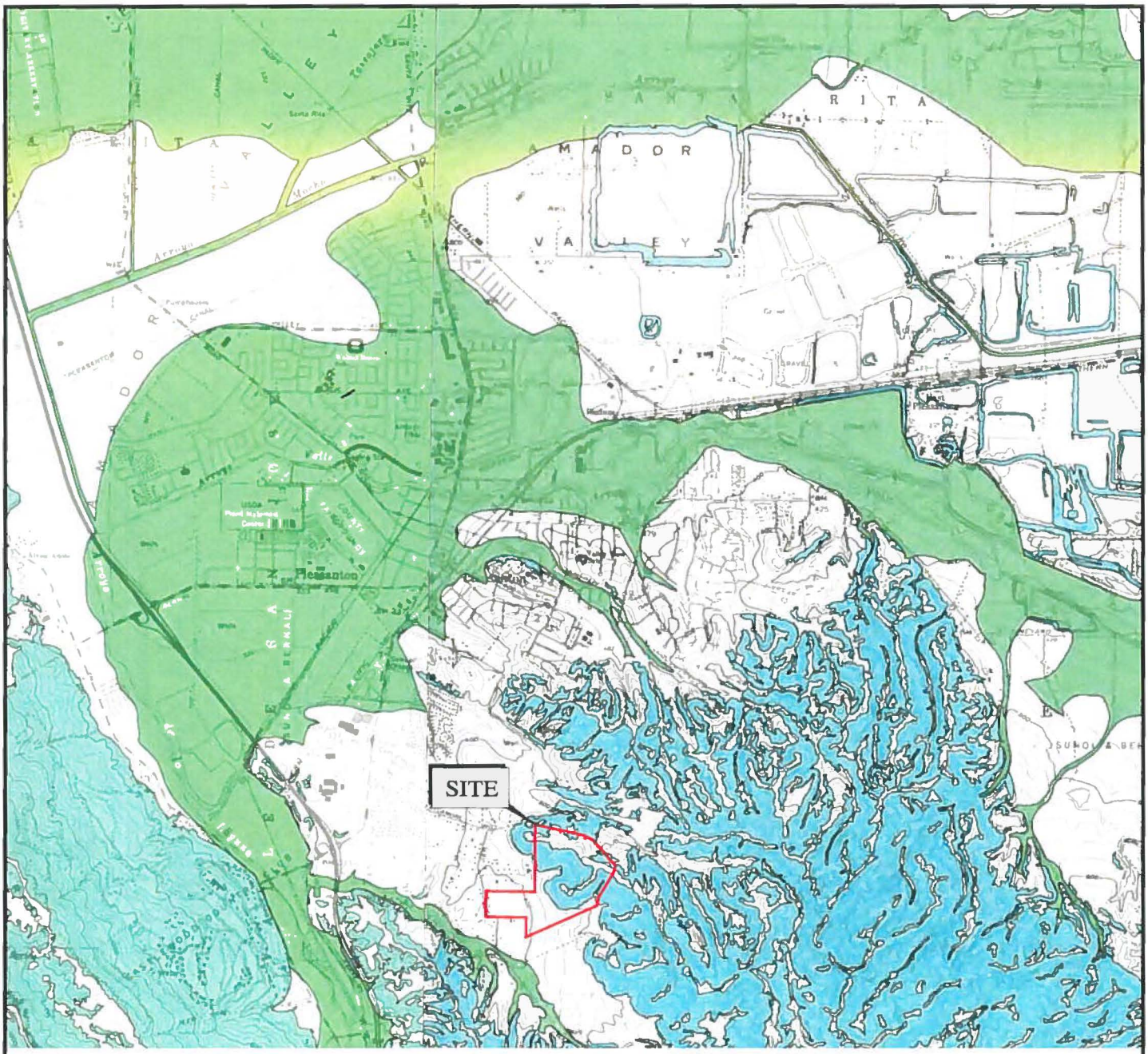


## EXPLANATION

### LIQUEFACTION

AREAS WHERE HISTORIC OCCURRENCE OF LIQUEFACTION, OR LOCAL GEOLOGICAL, GEOTECHNICAL AND GROUNDWATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

### EARTHQUAKE-INDUCED LANDSLIDES

AREAS WHERE PREVIOUS OCCURRENCE OF LANDSLIDE MOVEMENT, OR LOCAL TOPOGRAPHIC, GEOLOGICAL, GEOTECHNICAL AND SUBSURFACE WATER CONDITIONS INDICATE A POTENTIAL FOR PERMANENT GROUND DISPLACEMENTS SUCH THAT MITIGATION AS DEFINED IN PUBLIC RESOURCES CODE SECTION 2693(c) WOULD BE REQUIRED

N

0 FEET 4000

0 METERS 2000

BASE MAP SOURCE: CALIFORNIA DEPARTMENT OF CONSERVATION, CALIFORNIA GEOLOGICAL SURVEY, 2006

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SEISMIC HAZARD ZONES MAP
SPOTORNO PROPERTY
PLEASANTON, CALIFORNIA

PROJECT NO.: 6103.200.000
SCALE: AS SHOWN
DRAWN BY: SRP
CHECKED BY: JF

FIGURE NO. 5

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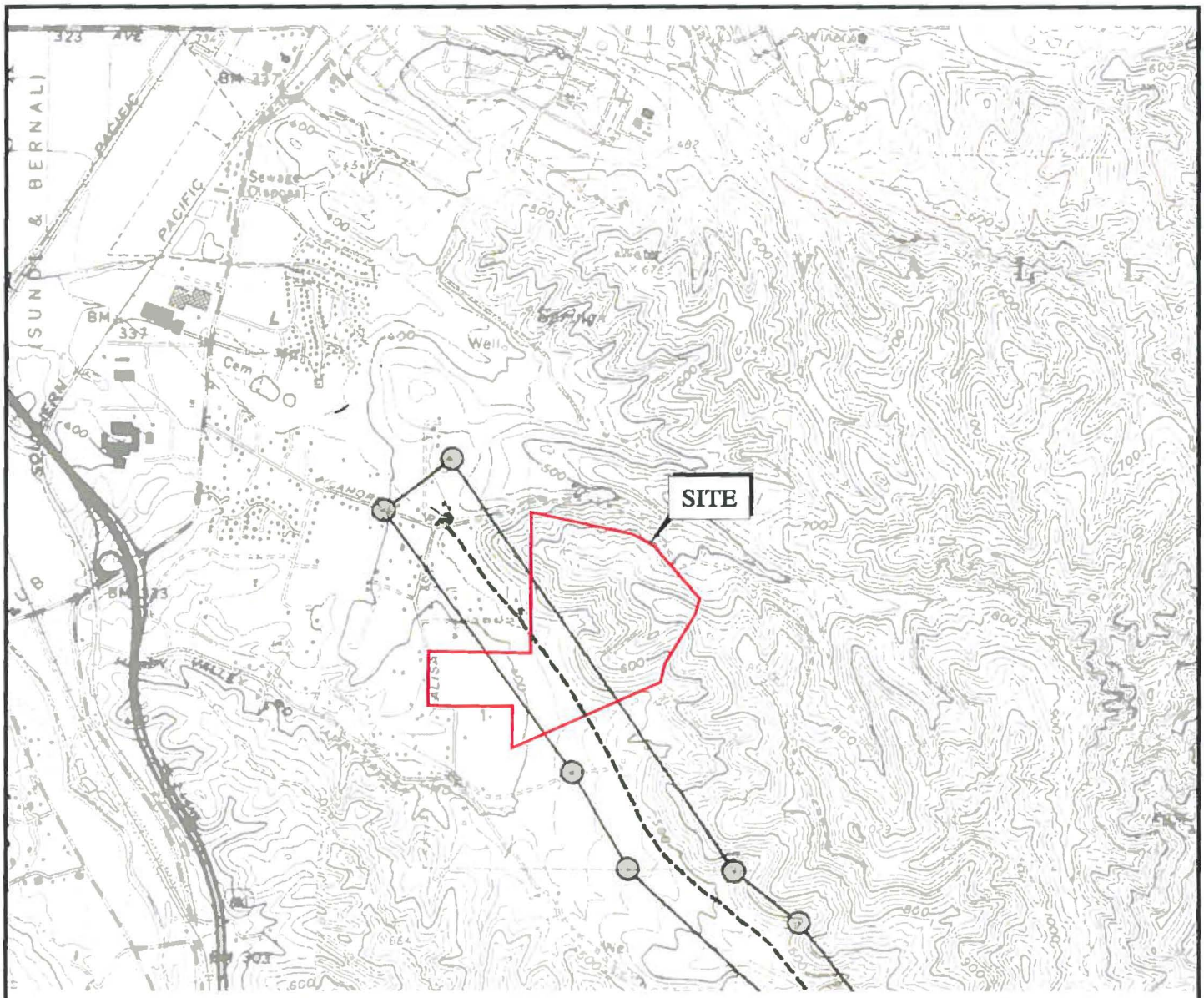


## EXPLANATION

1906 C — FAULTS CONSIDERED TO HAVE BEEN ACTIVE DURING HOLOCENE TIME AND TO HAVE A RELATIVELY HIGH POTENTIAL FOR SURFACE RUPTURE; SOLID LINE WHERE ACCURATELY LOCATED, LONG DASH WHERE APPROXIMATELY LOCATED, SHORT DASH WHERE INFERRED, DOTTED WHERE CONCEALED; QUERY (?) INDICATES ADDITIONAL UNCERTAINTY. EVIDENCE OF HISTORIC OFFSET INDICATED BY YEAR OF EARTHQUAKE-ASSOCIATED EVENT OR C FOR DISPLACEMENT CAUSED BY CREEP OR POSSIBLE CREEP

EARTHQUAKE FAULT ZONE BOUNDARIES; DELINEATED AS STRAIGHT-LINE SEGMENTS THAT CONNECT ENCIRCLED TURNING POINTS SO AS TO DEFINE EARTHQUAKE FAULT ZONE SEGMENTS

N

0 FEET 2000
0 METERS 1000

BASE MAP SOURCE: CDMG, 1993

ENGEO
Expect Excellence

EARTHQUAKE FAULT ZONE MAP
SPOTORNO PROPERTY
PLEASANTON, CALIFORNIA

| | | |
|---|---|---|
| PROJECT NO.: 6103.200.000 | | FIGURE NO. |
| SCALE: AS SHOWN | | 6 |
| DRAWN BY: SRP | CHECKED BY: JF | |

G:\Drafting\DRAFTING2_Dwg\6103\200\6103200000-6-FaultZoneZonesMap-0115.dwg Plot Date 1-07-15 spotters

ORIGINAL FIGURE PRINTED IN COLOR

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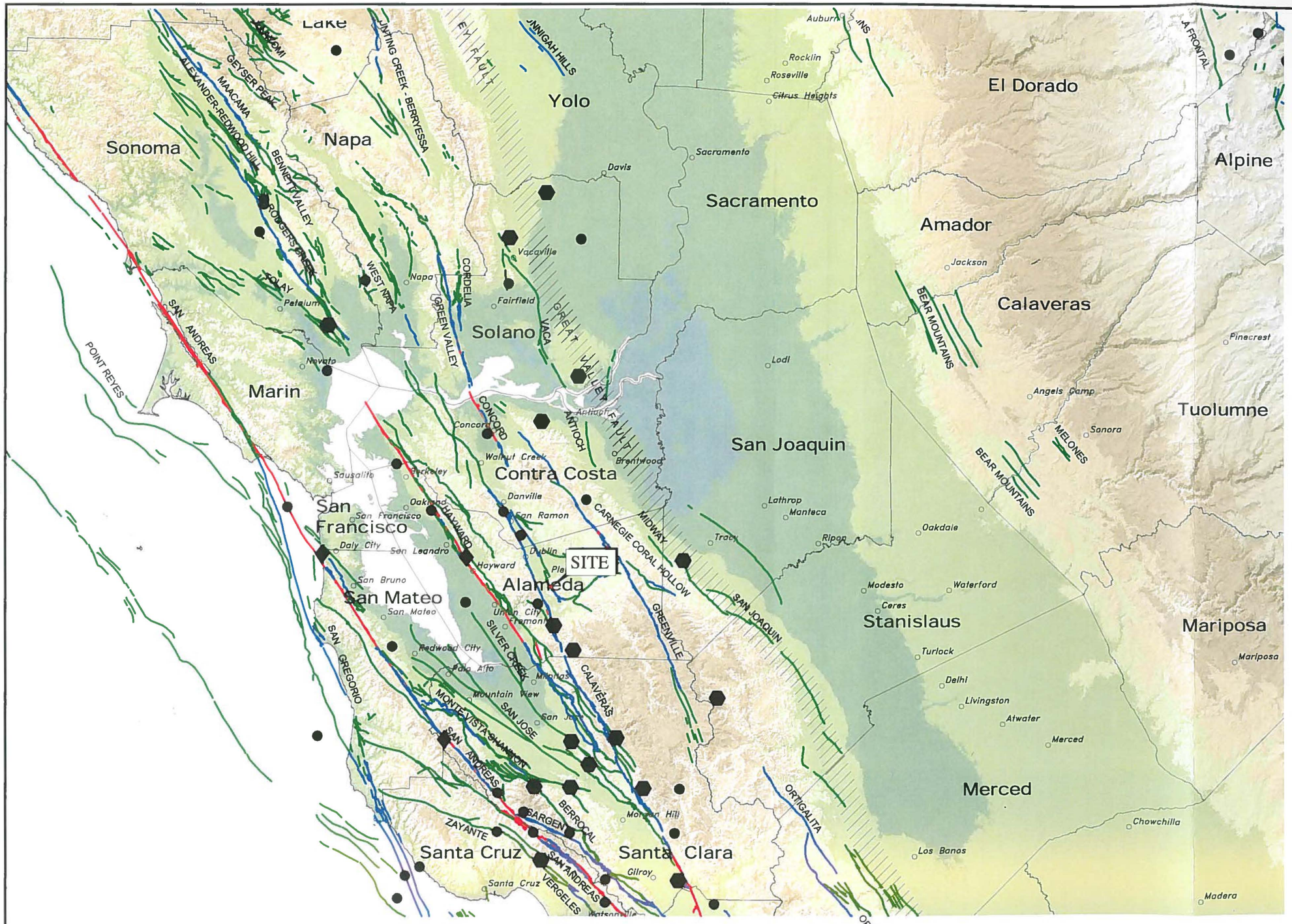


BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800–2000)

ENGEO
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REGIONAL FAULTING AND SEISMICITY
SPOTORNO PROPERTY
PLEASANTON, CALIFORNIA

| | | |
|---|---|---|
| PROJECT NO.: 6103.200.000 | | FIGURE NO |
| SCALE: AS SHOWN | | 7 |
| DRAWN BY: SRP | CHECKED BY: JF | |

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# Appendix F:
# Phase I Environmental Site Assessment

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# PHASE I ENVIRONMENTAL SITE ASSESSMENT

## SPOTORNO PROPERTY
## PLEASANTON, CA

**Submitted to:**
Mr. Mike O'Hara
Tim Lewis Communities
3500 Douglas Boulevard, Suite 270
Roseville, CA 95661

**Prepared by:**
ENGEO Incorporated

**January 9, 2015**

**Project No:**
6103.200.000

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Project No.
**6103.200.000**

January 9, 2015

Mr. Mike O'Hara
Tim Lewis Communities
3500 Douglas Boulevard, Suite 270
Roseville, CA 95661

Subject: Spotorno Property
Pleasanton, California

**PHASE I ENVIRONMENTAL SITE ASSESSMENT**

Dear Mr.O'Hara:

ENGEO is pleased to present our phase I environmental site assessment of the subject property (Property), located in Pleasanton, California. The attached report includes a description of the site assessment activities, along with ENGEO's findings, opinions, and conclusions regarding the Property.

ENGEO has the specific qualifications based on education, training, and experience to assess the nature, history, and setting of the Property, and has developed and performed all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312. We declare that, to the best of our professional knowledge and belief, the responsible charge for this study meets the definition of Environmental Professional as defined in Section 312.10 of 40 CFR Part 312 and ASTM 1527-13.

We are pleased to be of service to you on this project. If you have any questions concerning the contents of our report, please contact us.

Sincerely,

ENGEO Incorporated

Kelsey Gerhart, EIT

Brian Flaherty, CHG

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# EXECUTIVE SUMMARY

ENGEO conducted a phase I environmental site assessment for the Spotorno Property located east of Alisal Street and north of Westbridge Lane at 1000 Minnie Street in Pleasanton, California (Figures 1 and 2). The Property is irregular in area, encompassing approximately 112 acres, and is identified as Assessor Parcel Number (APN) 949-16-6 (Figure 3). The Property consists of undeveloped land currently used as livestock pasture.

This assessment included a review of local, state, tribal, and federal environmental record sources, standard historical sources, aerial photographs, fire insurance maps and physical setting sources. A reconnaissance of the Property was conducted to review site use and current conditions to check for the storage, use, production or disposal of hazardous or potentially hazardous materials and interviews with persons knowledgeable about current and past site use.

A review of historic resources indicates that the land has never been developed. Additionally, there is no evidence of past orchards on the Property.

The site reconnaissance and records review did not find documentation or physical evidence of soil or groundwater impairments associated with the use or past use of the Property. A review of regulatory databases maintained by county, state, tribal, and federal agencies found no documentation of hazardous materials violations or discharge on the Property and did not identify contaminated facilities within the appropriate American Society for Testing and Materials (ASTM) search distances that would reasonably be expected to impact the Property.

ENGEO has performed a phase I environmental site assessment in general conformance with the scope and limitations of ASTM E1527-13 for the Property. Based on the findings of this assessment, no further environmental studies are recommended at this time.

# 1.0 INTRODUCTION

ENGEO conducted a phase I environmental site assessment for the Spotorno Property located east of Alisal Street and north of Westbridge Lane at 1000 Minnie Street in Pleasanton, California (Figures 1 and 2). The Property is irregular in area, encompassing approximately 112 acres, and is identified as Assessor Parcel Number (APN) 949-16-6 (Figure 3). The Property consists of undeveloped land currently used as livestock pasture.

## 1.1 SITE LOCATION

The Property is located at 1000 Minnie Street, Pleasanton, California (Figures 1 and 2). The approximately 112-acre Property is identified as Assessor Parcel Number (APN) 949-16-6 (Figure 3).

## 1.2 SITE AND VICINITY CHARACTERISTICS

Review of published topographic maps found that the southwestern portion of the Property is relatively level at approximately 404 feet above mean sea level (msl). The eastern side of the Property is hilly terrain ranging between approximately 400 feet and 800 feet above msl. A review of the 1991 Wagner et al. Geologic Map (Wagner 1991) found that the Property is primarily underlain by sand and gravel (QT, Pilo-Pleistocene non-marine deposits).

Geocheck – The Physical Setting Source Summary of the Environmental Resources Data report (Appendix A) indicated two Federal United States Geological Survey (USGS) wells located within 1 mile of the Property. Well Number USGS40000184347 is mapped approximately 0.25 miles north-northwest of the Property with no groundwater level measurements reported for this well. Well Number USGS40000184367 is mapped approximately 0.45 miles northwest of the Property with no groundwater level measurements reported for this well.

We reviewed the Department of Water Resources On-line Water Data Library for depth to water in the vicinity of the site. The database did not identify wells with groundwater measurements within 1 mile of the Property.

The site-specific depth to groundwater and direction of groundwater flow was not determined as part of this assessment. Fluctuations in groundwater levels may occur seasonally and over a period of years due to variations in precipitation, temperature, irrigation and other factors. We were unable to find any groundwater information in the vicinity of the Property.

We reviewed the Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) web site and map database to determine if historic oil and/or gas wells were located within the Property. One well (API 00100021) is mapped approximately 0.5 miles southeast of the Property. The operator, Chevron U.S.A Inc., abandoned the well in December of 1958.

## 1.3 CURRENT USE OF PROPERTY/DESCRIPTION OF SITE IMPROVEMENTS

The Property consists of undeveloped land currently used as livestock pasture. A review of historic resources indicates that the land has never been developed and there is no evidence of past orchard use on the Property.

## 1.4 CURRENT USE OF ADJOINING PROPERTIES

The Property is subdivided into five lots that consist of undeveloped land currently used for livestock pasture (Figure 3). The southwestern portion of the Property is composed of three lots (Lots 8, 12, and 13) that are relatively flat and unoccupied with the exception of a windmill well pump. The eastern portion of the Property is divided into two larger lots (Lots 14 and 15) consisting of hilly terrain and open-space.

## 1.5 PURPOSE OF PHASE I ENVIRONMENTAL SITE ASSESSMENT

This assessment was performed at the request of Tim Lewis Communities for the purpose of environmental due diligence during Property acquisition. The objective of this phase I environmental site assessment is to identify Recognized Environmental Conditions (RECs) associated with the Property. As defined in the ASTM Standard Practice E 1527-13, an REC is "the presence or likely presence of any hazardous substances or petroleum products in, on, or at on a property: (1) due to release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment."

## 1.6 DETAILED SCOPE OF SERVICES

The scope of services performed included the following:

- A review of publicly available and practically reviewable standard local, state, tribal, and federal environmental record sources.
- A review of publicly available and practically reviewable standard historical sources, aerial photographs, fire insurance maps and physical setting sources.
- A reconnaissance of the Property to review site use and current conditions. The reconnaissance was conducted to check for the storage, use, production or disposal of hazardous or potentially hazardous materials.
- Interviews with owners/occupants and public sector officials.
- Preparation of this report with our findings, opinions, and conclusions.

## 1.7 SIGNIFICANT ASSUMPTIONS OR DEVIATIONS FROM ASTM STANDARD PRACTICE

There were no significant deviations from the ASTM Standard Practice.

## 1.8 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

The professional staff at ENGEO strives to perform its services in a proper and professional manner with reasonable care and competence, but is not infallible. The recommendations and conclusions presented in this report were based on the findings of our study, which were developed solely from the contracted services. The findings of the report are based in part on contracted database research, out-of-house reports and personal communications. The opinions formed by ENGEO are based on the assumed accuracy of the relied upon data in conjunction with our relevant professional experience related to such data interpretation. ENGEO assumes no liability for the validity of the materials relied upon in the preparation of this report.

This document must not be subject to unauthorized reuse; that is, reuse without written authorization of ENGEO. Such authorization is essential because it requires ENGEO to evaluate the document's applicability given new circumstances, not the least of which is passage of time. The findings from a phase I environmental site assessment are valid for one year after completion of the report. Updates of portions of the assessment may be necessary after a period of 180 days after completion.

This phase I environmental site assessment is not intended to represent a complete soil or groundwater characterization, nor define the depth or extent of soil or groundwater contamination. It is intended to provide an evaluation of potential environmental concerns associated with the use of the Property. A more extensive assessment that would include a subsurface exploration with laboratory testing of soil and groundwater samples could provide more definitive information concerning site-specific conditions. If additional assessment activities are considered for the Property and if other entities are retained to provide such services, ENGEO cannot be held responsible for any and all claims arising from or resulting from the performance of such services by other persons or entities. ENGEO can also not be held responsible from any and all claims arising or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

## 1.9 SPECIAL TERMS AND CONDITIONS

ENGEO has prepared this report for the exclusive use of our client, Tim Lewis Communities. It is recognized and agreed that ENGEO has assumed responsibility only for undertaking the study for the client. The responsibility for disclosures or reports to a third party and for remedial or mitigative action shall be solely that of the Client.

Laboratory testing of soil or groundwater samples was not within the scope of the contracted services. The assessment did not include an asbestos survey, an evaluation of lead-based paint, an inspection of light ballasts for polychlorinated biphenyls (PCBs), a radon evaluation, or a mold survey.

This report is based upon field and other conditions discovered at the time of preparation of ENGEO's assessment. Visual observations referenced in this report are intended only to represent conditions at the time of the reconnaissance. ENGEO would not be aware of site contamination, such as dumping and/or accidental spillage, that occurred subsequent to the reconnaissance conducted by ENGEO personnel.

# 2.0 USER-PROVIDED INFORMATION

## 2.1 PROPERTY RECORDS

### 2.1.1 Title Report/Ownership

The Title Report lists recorded land title detail, ownership fees, leases, land contracts, easements, liens, deficiencies, and other encumbrances attached to or recorded against a subject property. Laws and regulations pertaining to land trusts vary from state to state and the detail of information presented in a Title Report can vary greatly by jurisdiction. As a result, ENGEO utilizes a Title Report, when provided to us, as a supplement to other historical record sources.

A Preliminary Title Report for the Property, prepared by First American Title Company and dated November 26, 2014, was provided for our review. The Property title is vested in AVS Ranch, Llc, A California Limited Liability Company (successor by merger to the Alex V. Spotorno Family Living Limited Partnership, A California Limited Partnership) and Alex V. Spotorno, Trustee of The Alex V. Spotorno Trust, Utd (12/11/86).

No references to environmental liens, deed restrictions or other potential environmental issues were noted. This report is included in Appendix D.

### 2.1.2 Environmental Liens and Activity Use Limitations

Environmental Data Resources, Inc. (EDR) did not provide an Environmental Lien Search Report for the Property at the time of report preparation.

## 2.2 USER KNOWLEDGE OF PROPERTY

Completed Client and Key Site Manager questionnaires were not provided for our review prior to publication of this report.

# 3.0 RECORDS REVIEW

## 3.1 PREVIOUS ENVIRONMENTAL REPORTS

TERRASEARCH, Inc.; "Phase I Environmental Site Assessment on 166 Acre Parcel; Spotorno Property, Pleasanton, California; July 24, 1997.

According to the Phase I Environmental Site Assessment completed by TERRASEARCH in 1997, the Property has been used for ranching and grazing since the early 1900s. Based on the findings of their research, no Recognized Environmental Conditions (RECs) and no historical RECs were identified for the Property. In their report, TERRASEARCH, Inc. concluded that further environmental assessment of the subject site is not warranted.

## 3.2 HISTORICAL RECORD SOURCES

The purpose of the historical record review is to develop a history of the previous uses or occupancies of the Property and surrounding area in order to identify those uses or occupancies that are likely to have led to recognized environmental conditions on the Property.

### 3.2.1 Historical Topographic Maps

Historical USGS topographic maps were reviewed to determine if discernible changes in topography or improvements pertaining to the Property had been recorded. The following maps were provided to us through an EDR Historical Topographic Map Report, presented in Appendix C.

**TABLE 3.2.1-1**
Historical Topographic Maps

| Quad | Year | Series | Scale |
|---|---|---|---|
| Pleasanton | 1906 | 15 | 1:62500 |
| Pleasanton | 1947 | 15 | 1:50000 |
| Livermore | 1953 | 7.5 | 1:24000 |
| Livermore | 1953 | 15 | 1:62500 |
| Livermore | 1961 | 7.5 | 1:24000 |
| Livermore | 1961 | 15 | 1:62500 |
| Livermore | 1968 | 7.5 | 1:24000 |
| Livermore | 1973 | 7.5 | 1:24000 |
| Livermore | 1980 | 7.5 | 1:24000 |

1906 and 1947 Maps – No structures are mapped on the Property. Roads are mapped in the current locations of Happy Valley Road, Alisal Street, Sycamore Road, and Sunol Boulevard. Pleasanton Ridge and Arroyo de la Laguna. The Southern Pacific Railway and the Western Pacific Railway are mapped west of the Property.

1953 and 1961 Maps – Conditions at the Property are similar to those depicted in the previous maps. Several smaller structures are south and west of the Property. Minnie Street and a well are mapped north-northwest of the Property. A second well is mapped further south of the parcel. The City of Pleasanton appears to be further developed with the inclusion of Amador Valley High School, U.S. Gov't Nursery, and Kottinger Village. Small orchards are west, northwest, and southwest of the Property. The Castlewood Country Club is mapped west of the Property and the City of Livermore is mapped north-northeast of the Property.

1968 Maps – Conditions at the Property and surrounding area are similar to those depicted in the previous maps.

1973 and 1980 Maps – Conditions shown at the Property are similar to those depicted in the previous maps. One large structure is now south of the Property and several structures have been added to the adjacent parcels north and west of the Property.

### 3.2.2 Aerial Photographs

The following aerial photographs, provided by EDR, were reviewed for information regarding past conditions and land use at the Property and in the immediate vicinity. These photographs are presented in Appendix E.

**TABLE 3.2.2-1**
Aerial Photographs

| Flyer | Year | Scale |
|---|---|---|
| USGS | 1939 | 1"=500' |
| USGS | 1940 | 1"=500' |
| USGS | 1949 | 1"=500' |
| USGS | 1958 | 1"=500' |
| USGS | 1966 | 1"=500' |
| USGS | 1968 | 1"=500' |
| USGS | 1979 | 1"=500' |
| USGS | 1982 | 1"=500' |
| USGS/DOQQ | 1993 | 1"=500' |
| USGS | 1998 | 1"=500' |
| USDA/NAIP | 2005 | 1"=500' |
| USDA/NAIP | 2006 | 1"=500' |

| Flyer | Year | Scale |
|---|---|---|
| USDA/NAIP | 2009 | 1”=500’ |
| USDA/NAIP | 2010 | 1”=500’ |
| USDA/NAIP | 2012 | 1”=500’ |

1939 and 1940 Photographs – No structures are visible on the Property. Roads are evident in the current locations of Happy Valley Road, Alisal Street, and Sycamore Road. Several residential structures are apparent on the adjacent parcels south and west of the Property. The surrounding parcels support agricultural practices, including small orchards southwest, west, and northwest of the Property.

1949 and 1958 Photographs – The Property appears to consist of dry crops and open pasture. A large structure that appears to support agricultural practices is present on the adjacent parcel located north of the rectangular area that makes up the southwestern portion of the Property. Additional residential structures are now evident south of the Property.

1966 through 1998 Photographs – Conditions at the Property are similar to those visible in the previous photographs. Residential structures located northeast of the Property boundary appear to be their current locations. Development is evident west of the Property.

2005 through 2012 Photographs – Conditions at the Property are similar to those visible in the previous photographs. Residential developments are on the adjacent parcel west and northwest of the Property. The Callippe Preserve Golf Course is evident south of the Property.

### 3.2.3 Fire Insurance Maps

EDR prepared a Sanborn Fire insurance map search for the Property and surrounding properties. EDR reported that no maps were available for the Property and surrounding properties. The Sanborn Map Report is presented in Appendix B.

### 3.2.4 City Directory

City Directories, published since the 18th century for major towns and cities, list the name of the resident or business associated with each address. A city directory search conducted by EDR is located in Appendix F.

Alex Spotorno was the only listing reported in the city directory search under the address 1000 Minnie Street (2013. 2008, 1999).

Other listings in the vicinity of the Property are primarily associated with residential use.

## 3.3 ENVIRONMENTAL RECORD SOURCES

EDR performed a search of federal, tribal, state, and local databases regarding the Property and nearby properties. Details regarding the databases searched by EDR are provided in Appendix A. A list of the facilities documented by EDR within the approximate minimum search distance of the Property is provided below.

### 3.3.1 Standard Environmental Records

#### 3.3.1.1 Subject Property

The Property is not listed on any of the EDR-provided Federal ASTM Standard sources.

#### 3.3.1.2 Other Properties

The following database includes a facility listed within the appropriate ASTM search distances of the Property on Standard Environmental Records source.

**TABLE 3.3.1.2-1**

| Facility | Street | Database |
|---|---|---|
| Applied Biosystems | 6001 Sunol Boulevard | ENVIROSTOR, VCP |

### 3.3.2 Additional Environmental Records

#### 3.3.2.1 Subject Property

The Property is not listed on any of the EDR provided Federal ASTM Additional sources.

#### 3.3.2.2 Other Properties

The following database includes a facility listed within the appropriate ASTM search distances of the Property on the Additional Environmental Record source.

**TABLE 3.3.2.2-1**

| Facility | Street | Database |
|---|---|---|
| Applied Biosystems | 6001 Sunol Boulevard | DEED, WDS, NPDES |

Based on the distances to the identified database sites, regional topographic gradient, and the EDR findings, it is likely that the above-stated database site does not pose an environmental risk to the Property. Properties that are on the “Orphan Summary” list appear to be located beyond the ASTM recommended radius search criteria.

## 3.4 REGULATORY AGENCY FILES AND RECORDS

The following agencies were contacted pertaining to possible past development and/or activity at the Property.

- City of Pleasanton Community Development Department, Building & Safety Services Division
- City of Pleasanton Community Development Department, Planning Services Division
- Livermore-Pleasanton Fire Department
- Alameda County Environmental Health Department
- Alameda County Fire Department
- Alameda County Public Works Agency, Building Inspection Division
- Alameda County Assessor's Office
- California Regional Water Quality Control Board
- Department of Toxic Substances Control

City of Pleasanton Community Development Department, Building and Safety Services Division – The City of Pleasanton Community Development Department, Building & Safety Services Division was contacted regarding historical records pertaining to the Property. On January 7, 2015, we searched the database located in the City of Pleasanton's Civic Center and found several permits and inspection reports regarding the installation of a furnace (2005- 2007). However, the permits identified refer to a residence outside of our study area. No other documentation relating to the Property was identified.

City of Pleasanton Community Development Department, Planning Services Division – The City of Pleasanton Community Development Department, Planning Services Division was contacted regarding historical records pertaining to the Property. On January 6, 2015, a representative reported the following:

- A lot line adjustment was approved in 2010, Case PLLA-105.

- The Property was adopted into the "Happy Valley Specific Plan Area" in June 1998. The eastern portion of the Property is identified as "Agricultural/Open Space" (PUD-A/OS).

The documents provided by the City of Pleasanton Community Development Department, Planning Services Division can be found in Appendix G.

Livermore-Pleasanton Fire Department – The Livermore-Pleasanton Fire Department was contacted regarding files for the Property. We were informed by a representative on January 7, 2015 that no files were identified relating to the Property.

Alameda County Environmental Health Department – The ACEH Department was contacted to determine if files exist for the Property. We were informed by a representative on January 6, 2015 that no files were identified relating to the Property.

Alameda County Fire Department – The Alameda County Fire Department was contacted to determine if files exist for the Property. We did not receive a response at the time of report completion.

Alameda County Public Works Agency, Building Inspection Division – The Alameda County Public Works Agency, Building Inspection Division was contacted to determine if files exist for the Property. We did not receive a response at the time of report completion.

Alameda County Assessor's Office – The Alameda County Assessor's Office website was viewed for information regarding the Property. Information on the website confirmed that the Property is identified by APN 949-16-6.

California Regional Water Quality Control Board – The California Regional Water Quality Control Board's online database, GeoTracker, was reviewed for files relating to the Property and surrounding properties. There were no listings for the Property.

Department of Toxic Substances Control – We reviewed the EnviroStor Database maintained by the Department of Toxic Substances Control (DTSC) to identify ongoing environmental site assessment and remedial activities within the immediate vicinity of the Property. There were no records for the Property listed in the EnviroStor Database.

# 4.0 SITE RECONNAISSANCE

## 4.1 METHODOLOGY

ENGEO conducted a reconnaissance of the Property on January 6, 2015. The reconnaissance was performed by Randy Hildebrant, Project Engineer of ENGEO. The Property was viewed for hazardous materials storage, superficial staining or discoloration, debris, stressed vegetation, or other conditions that may be indicative of potential sources of soil or groundwater contamination. The site was also checked for evidence of fill/ventilation pipes, ground subsidence, or other evidence of existing or preexisting underground storage tanks. Photographs taken during the site reconnaissance are presented in Figure 4.

## 4.2 GENERAL SITE SETTING

The Property is subdivided into five lots that consist of undeveloped land currently used as livestock pasture (Figure 3). The southwestern portion of the Property is made up of three lots (Lots 8, 12, and 13) that are relatively flat and unoccupied with the exception of a windmill well pump. The eastern portion of the Property is divided into two larger lots (Lots 14 and 15) consisting of hilly terrain and open-space.

The ridge of lots 14 and 15, located on north-northeastern side of the Property, was inaccessible during the reconnaissance; however, based on our understanding of the Project, this portion of the Property will remain open-space.

## 4.3 EXTERIOR OBSERVATIONS

Structures. No structures were observed on the Property during the reconnaissance.

Hazardous Substances and Petroleum Products in Connection with Identified Uses. No hazardous substances or petroleum products were observed within the Property during the reconnaissance.

Storage Tanks. No above-ground storage tanks or evidence of existing underground storage tanks was observed during the site reconnaissance.

Odors. No odors indicative of hazardous materials or petroleum material impacts were noted at the time of the reconnaissance.

Pools of Potentially Hazardous Liquid. No pools of potentially hazardous liquid were observed within the Property at the time of our reconnaissance.

Drums. No drums were observed on the Property at the time of our reconnaissance.

Hazardous Substance and Petroleum Product Containers. No hazardous substance or petroleum product containers were observed on the Property at the time of our reconnaissance.

Polychlorinated Biphenyls (PCBs). No PCB-containing materials, including transformers, were observed within the Property during our site reconnaissance.

Pits, Ponds and Lagoons. No pits, ponds or lagoons were observed within the Property at the time of our reconnaissance.

Stained Soil/Pavement. No stained soil or pavement was observed within the Property at the time of our reconnaissance.

Stressed Vegetation. No signs of stressed vegetation were observed on the Property at the time of our reconnaissance.

Solid Waste/Debris. No disposal of solid waste was observed at the Property.

Wastewater. No wastewater conveyance systems were observed at the Property during the reconnaissance.

Wells. A windmill powered well located on the southwestern side of the Property was observed at the time of site reconnaissance.

Septic Systems. No evidence of an existing septic system was observed at the time of our reconnaissance.

### 4.4 INTERIOR OBSERVATIONS

There are no structures on the Property.

### 4.5 ASBESTOS-CONTAINING MATERIALS AND LEAD-BASED PAINT

An asbestos and lead-based paint survey was not conducted as part of this assessment.

### 4.6 INDOOR AIR QUALITY

An evaluation of indoor air quality, mold, or radon was not included as part of the contracted scope of services. The California Department of Health Services has conducted studies of radon risks throughout the state, sorted by zip code. Results of the studies indicate that 27 tests were conducted within the Property zip code, with 2 of the tests exceeding the current EPA action level of 4 picocuries per liter [pCi/L][1]).

In accordance with ASTM E2600-10 (Tier 1) (*Standard Guide for Vapor Encroachment Screening on Property Involved in Real Estate Transactions*); there are no potential petroleum hydrocarbon sources for vapor intrusion within 1/10 mile of the Property, and no potential volatile organic compound (VOCs) sources within 1/3 mile of the Property.

## 5.0 INTERVIEWS

Completed Client and Key Site Manager questionnaires were not provided for our review prior to publication of this report.

## 6.0 EVALUATION

### 6.1 FINDINGS

The site reconnaissance and records review did not find documentation or physical evidence of soil or groundwater impairments associated with the use or past use of the Property. A review of regulatory databases maintained by county, state and federal agencies found no documentation of hazardous materials violations or discharge on the Property.

The Phase I completed by TERRASEARCH in 1997 found that further environmental assessment of the subject site is not warranted.

Based on the findings of this assessment, no Recognized Environmental Conditions (RECs) and no historical RECs were identified for the Property.

---

[1] California Department of Health Services – Division of Drinking Water and Environmental Management – Radon (http://www.cdph.ca.gov/HealthInfo/environhealth/Documents/Radon/CaliforniaRadonDatabase.pdf).

## 6.2 OPINIONS AND DATA GAPS

It is our opinion that the findings of this study are based on a sufficient level of information obtained during our contracted scope of services to render a conclusion as to whether additional appropriate investigation is required to identify the presence or likely presence of a REC. The following data gap was identified:

- The Alameda Fire Department did not respond to our request prior to publication of this report.
- The Alameda County Public Works Agency, Building Inspection Division did not respond to our request prior to publication of this report.
- Completed Client and Key Site Manager questionnaires were not provided for our review prior to publication of this report.
- The ridge of lots 14 and 15, located on north-northeastern side of the Property, was inaccessible during the reconnaissance; however, based on our understanding of the Project, this portion of the Property will remain open-space.

The data gaps identified during this process do not affect the conclusions as to the presence or lack of presence of RECs at the Property.

## 6.3 CONCLUSIONS

This assessment included a review of local, state, tribal, and federal environmental record sources, standard historical sources, aerial photographs, fire insurance maps and physical setting sources. A reconnaissance of the Property was conducted to review site use and current conditions to check for the storage, use, production or disposal of hazardous or potentially hazardous materials and interviews with persons knowledgeable about current and past site use.

A review of historic resources found that there is no history of site development. Additionally, there is no evidence of past orchards on the Property.

The site reconnaissance and records review did not find documentation or physical evidence of soil or groundwater impairments associated with the use or past use of the Property. A review of regulatory databases maintained by county, state, tribal, and federal agencies found no documentation of hazardous materials violations or discharge on the Property and did not identify contaminated facilities within the appropriate American Society for Testing and Materials (ASTM) search distances that would reasonably be expected to impact the Property.

ENGEO has performed a phase I environmental site assessment in general conformance with the scope and limitations of ASTM E1527-13 for the Property. Based on the findings of this assessment, no further environmental studies are recommended at this time.

# SELECTED REFERENCES

California Department of Water Resources (http://wdl.water.ca.gov).

California Department of Conservation, Department of Oil, Gas and Geothermal Resources Website; Oil and Gas Maps, (http://www.consrv.ca.gov/dog/maps/pages/index_map.aspx).

California Department of Health Services – Division of Drinking Water and Environmental Management – Radon (http://ww2.cdph.ca.gov/HealthInfo/environhealth/Documents/Radon/CaliforniaRadonDatabase.pdf)

EnviroStor Website, Department of Toxic Substances Control, http://www.envirostor.dtsc.ca.gov/public//

GeoTracker Website, State Water Resources Control Board, http://geotracker.swrcb.ca.gov/.

Google Maps (http://maps.google.com)

United States Environmental Protection Agency Indoor Air Quality Website (http://www.cdph.ca.gov/HealthInfo/environhealth/Documents/Radon/CaliforniaRadonDatabase.pdf)

Wagner, D.L, et al., Geologic Map of the San Francisco- San Jose Quadrangle, 1991.

## LIST OF FIGURES

**Figure 1 - Vicinity Map**
**Figure 2 - Site Map**
**Figure 3 - Assessor's Parcel Map**
**Figure 4A and 4B - Site Photographs**

**FIGURES**

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N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO Expect Excellence

# VICINITY MAP

SPOTORNO PROPERTY

PLEASANTON, CALIFORNIA

| | |
|---|---|
| PROJECT NO.: | 6103.200.000 |
| SCALE: | AS SHOWN |
| DRAWN BY: LL | CHECKED BY: RG |

FIGURE NO. 1

G:\Drafting\DRAFTING2_Dwg\6103\200\ESA\6103200000-ESA-1-VICMAP-0115.dwg Plot Date:1-08-15 llee

ORIGINAL FIGURE PRINTED IN COLOR

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N

0 FEET 600
0 METERS 300

BASE MAP SOURCE: GOOGLE EARTH PRO

ENGEO
Expect Excellence

SITE MAP
SPOTORNO PROPERTY
PLEASANTON, CALIFORNIA

| | |
|---|---|
| PROJECT NO.: | 6103.200.000 |
| SCALE: | AS SHOWN |
| DRAWN BY: LL | CHECKED BY: RG |

FIGURE NO. 2

G:\Drafting\DRAFTING2_Dwg\6103\200\ESA\6103200000-ESA-2-SITEPLAN-0115.dwg Plot Date: 1-08-15 llee

ORIGINAL FIGURE PRINTED IN COLOR

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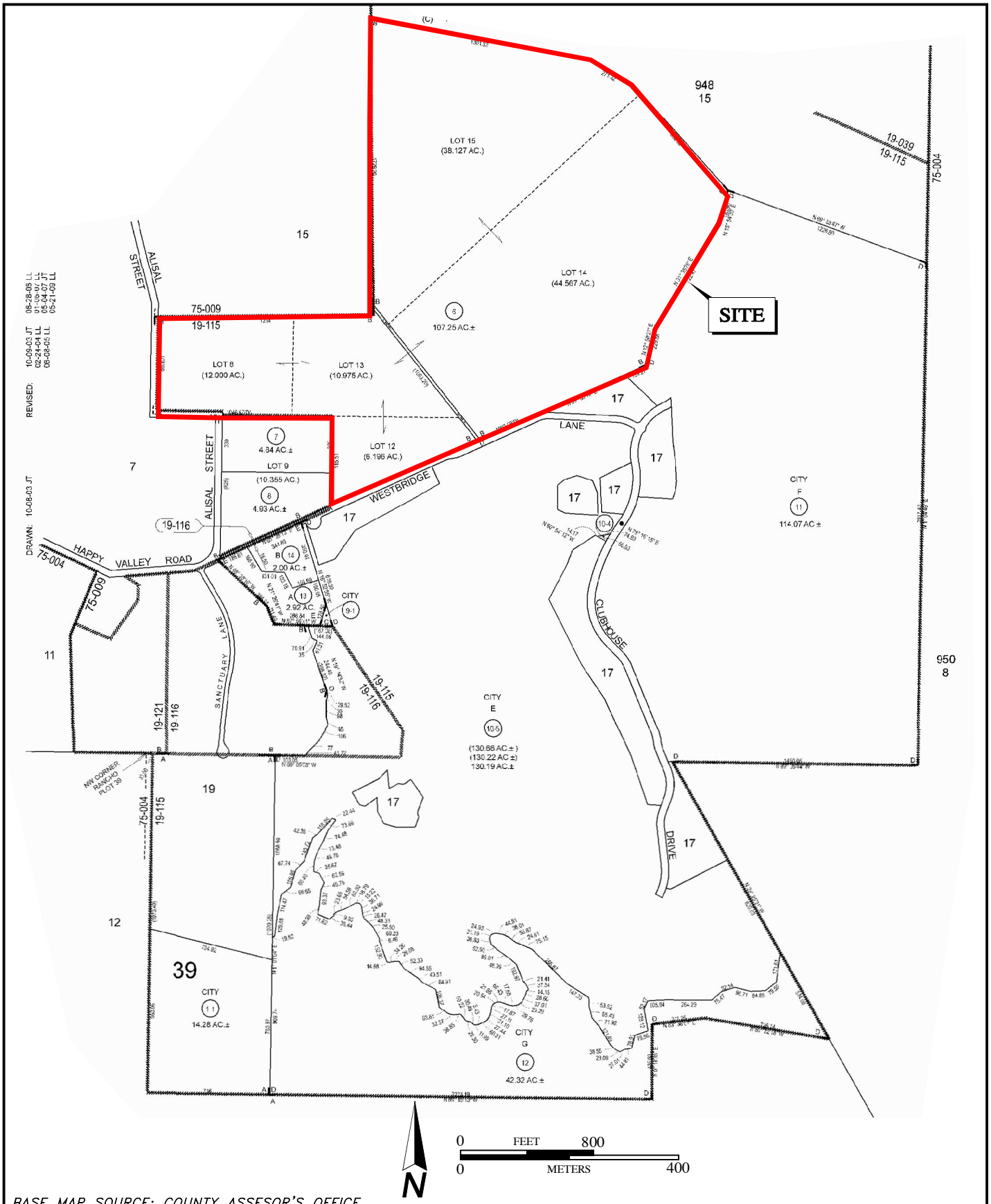


BASE MAP SOURCE: COUNTY ASSESOR'S OFFICE

ENGEO Expect Excellence

# ASSESSOR'S PARCEL MAP

SPOTORNO PROPERTY

PLEASANTON, CALIFORNIA

| | |
|---|---|
| PROJECT NO.: | 6103.200.000 |
| SCALE: | AS SHOWN |
| DRAWN BY: LL | CHECKED BY: RG |

FIGURE NO. 3

G:\Drafting\DRAFTING2_Dwg\6103\200\ESA\6103200000-ESA-3-APNMAP-0115.dwg Plot Date: 1-09-15 llee

ORIGINAL FIGURE PRINTED IN COLOR

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VIEW CAPTURED FROM THE PROPERTY ENTRANCE LOCATED ON ALISAL STREET

A WINDMILL WELL PUMP LOCATED ON THE SOUTHWESTERN SIDE OF THE PROPERTY

VIEW OF THE PROPERTY CAPTURED FROM THE SOUTHEAST

VIEW OF THE SOUTHEASTERN PORTION OF THE PROPERTY

OPEN-SPACE LOCATED ON THE EASTERN SIDE OF THE PROPERTY (LOT 14)

OPEN-SPACE LOCATED ON THE EASTERN SIDE OF THE PROPERTY-2 (LOT 14)

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SITE PHOTOGRAPHS

SPOTORNO PROPERTY

PLEASANTON, CALIFORNIA

| | |
|---|---|
| PROJECT NO.: 6103.200.000 | FIGURE NO. 4 |
| SCALE: NO SCALE | |
| DRAWN BY: LL | CHECKED BY: RG |

G:\Drafting\DRAFTING2_Dwg\6103\200\ESA\6103200000-ESA-4-SITEPHOTOS-0115.dwg Plot Date: 1-08-15 llee

ORIGINAL FIGURE PRINTED IN COLOR

# APPENDIX A

## ENVIRONMENTAL DATA RESOURCES, INC.

### Radius Map Report

APPENDIX A

**Sportono Ranch**
1000 Minnie Street
Pleasanton, CA 94566

Inquiry Number: 04173137.2r
January 05, 2015

# The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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| Map Findings Summary | 4 |
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| Orphan Summary | 12 |
| Government Records Searched/Data Currency Tracking | GR-1 |

## GEOCHECK ADDENDUM

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***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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# EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

**TARGET PROPERTY INFORMATION**

**ADDRESS**

1000 MINNIE STREET
ALAMEDA County, CA 94566

**COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.6359000 - 37˚ 38' 9.24'' |
| Longitude (West): | 121.8665000 - 121˚ 51' 59.40'' |
| Universal Tranverse Mercator: | Zone 10 |
| UTM X (Meters): | 600012.4 |
| UTM Y (Meters): | 4165818.0 |
| Elevation: | 404 ft. above sea level |

**USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY**

| | |
|---|---|
| Target Property Map: | 37121-F7 LIVERMORE, CA |
| Most Recent Revision: | 1980 |
| South Map: | 37121-E7 LA COSTA VALLEY, CA |
| Most Recent Revision: | 1999 |
| Southwest Map: | 37121-E8 NILES, CA |
| Most Recent Revision: | 1980 |
| West Map: | 37121-F8 DUBLIN, CA |
| Most Recent Revision: | 1980 |

**AERIAL PHOTOGRAPHY IN THIS REPORT**

| | |
|---|---|
| Portions of Photo from: | 20120520 |
| Source: | USDA |

**TARGET PROPERTY SEARCH RESULTS**

The target property was not listed in any of the databases searched by EDR.

# EXECUTIVE SUMMARY

**DATABASES WITH NO MAPPED SITES**

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

**STANDARD ENVIRONMENTAL RECORDS**

***Federal NPL site list***

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

***Federal Delisted NPL site list***

Delisted NPL ..... National Priority List Deletions

***Federal CERCLIS list***

CERCLIS ..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ..... Federal Facility Site Information listing

***Federal CERCLIS NFRAP site List***

CERC-NFRAP ..... CERCLIS No Further Remedial Action Planned

***Federal RCRA CORRACTS facilities list***

CORRACTS ..... Corrective Action Report

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

***Federal RCRA generators list***

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-CESQG ..... RCRA - Conditionally Exempt Small Quantity Generator

***Federal institutional controls / engineering controls registries***

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROL ..... Sites with Institutional Controls
LUCIS ..... Land Use Control Information System

***Federal ERNS list***

ERNS ..... Emergency Response Notification System

***State- and tribal - equivalent NPL***

RESPONSE ..... State Response Sites

# EXECUTIVE SUMMARY

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF ..... Solid Waste Information System

***State and tribal leaking storage tank lists***

LUST ..... Geotracker's Leaking Underground Fuel Tank Report
SLIC ..... Statewide SLIC Cases
Alameda County CS ..... Contaminated Sites
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

***State and tribal registered storage tank lists***

UST ..... Active UST Facilities
AST ..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land
FEMA UST ..... Underground Storage Tank Listing

***State and tribal voluntary cleanup sites***

VCP ..... Voluntary Cleanup Program Properties
INDIAN VCP ..... Voluntary Cleanup Priority Listing

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS ..... A Listing of Brownfields Sites

***Local Lists of Landfill / Solid Waste Disposal Sites***

ODI ..... Open Dump Inventory
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
SWRCY ..... Recycler Database
HAULERS ..... Registered Waste Tire Haulers Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands
WMUDS/SWAT ..... Waste Management Unit Database

***Local Lists of Hazardous waste / Contaminated Sites***

US CDL ..... Clandestine Drug Labs
HIST Cal-Sites ..... Historical Calsites Database
SCH ..... School Property Evaluation Program
Toxic Pits ..... Toxic Pits Cleanup Act Sites
CDL ..... Clandestine Drug Labs
US HIST CDL ..... National Clandestine Laboratory Register

***Local Lists of Registered Storage Tanks***

CA FID UST ..... Facility Inventory Database
HIST UST ..... Hazardous Substance Storage Container Database
SWEEPS UST ..... SWEEPS UST Listing

***Local Land Records***

LIENS 2 ..... CERCLA Lien Information

| | |
|---|---|
| LIENS | Environmental Liens Listing |
| DEED | Deed Restriction Listing |

***Records of Emergency Release Reports***

| | |
|---|---|
| HMIRS | Hazardous Materials Information Reporting System |
| CHMIRS | California Hazardous Material Incident Report System |
| LDS | Land Disposal Sites Listing |
| MCS | Military Cleanup Sites Listing |
| SPILLS 90 | SPILLS 90 data from FirstSearch |

***Other Ascertainable Records***

| | |
|---|---|
| RCRA NonGen / NLR | RCRA - Non Generators / No Longer Regulated |
| DOT OPS | Incident and Accident Data |
| DOD | Department of Defense Sites |
| FUDS | Formerly Used Defense Sites |
| CONSENT | Superfund (CERCLA) Consent Decrees |
| ROD | Records Of Decision |
| UMTRA | Uranium Mill Tailings Sites |
| US MINES | Mines Master Index File |
| TRIS | Toxic Chemical Release Inventory System |
| TSCA | Toxic Substances Control Act |
| FTTS | FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act) |
| HIST FTTS | FIFRA/TSCA Tracking System Administrative Case Listing |
| SSTS | Section 7 Tracking Systems |
| ICIS | Integrated Compliance Information System |
| PADS | PCB Activity Database System |
| MLTS | Material Licensing Tracking System |
| RADINFO | Radiation Information Database |
| FINDS | Facility Index System/Facility Registry System |
| RAATS | RCRA Administrative Action Tracking System |
| RMP | Risk Management Plans |
| CA BOND EXP. PLAN | Bond Expenditure Plan |
| NPDES | NPDES Permits Listing |
| UIC | UIC Listing |
| Cortese | "Cortese" Hazardous Waste & Substances Sites List |
| HIST CORTESE | Hazardous Waste & Substance Site List |
| CUPA Listings | CUPA Resources List |
| Notify 65 | Proposition 65 Records |
| DRYCLEANERS | Cleaner Facilities |
| WIP | Well Investigation Program Case List |
| ENF | Enforcement Action Listing |
| HAZNET | Facility and Manifest Data |
| EMI | Emissions Inventory Data |
| INDIAN RESERV | Indian Reservations |
| SCRD DRYCLEANERS | State Coalition for Remediation of Drycleaners Listing |
| PCB TRANSFORMER | PCB Transformer Registration Database |
| US FIN ASSUR | Financial Assurance Information |
| EPA WATCH LIST | EPA WATCH LIST |
| LEAD SMELTERS | Lead Smelter Sites |
| PRP | Potentially Responsible Parties |
| 2020 COR ACTION | 2020 Corrective Action Program List |
| COAL ASH DOE | Steam-Electric Plant Operation Data |

# EXECUTIVE SUMMARY

HWP ..... EnviroStor Permitted Facilities Listing
HWT ..... Registered Hazardous Waste Transporter Database
PROC ..... Certified Processors Database
Financial Assurance ..... Financial Assurance Information Listing
WDS ..... Waste Discharge System
MWMP ..... Medical Waste Management Program Listing
US AIRS ..... Aerometric Information Retrieval System Facility Subsystem
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List

**EDR HIGH RISK HISTORICAL RECORDS**

***EDR Exclusive Records***

EDR MGP ..... EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat ..... EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners ..... EDR Exclusive Historic Dry Cleaners

**EDR RECOVERED GOVERNMENT ARCHIVES**

***Exclusive Recovered Govt. Archives***

RGA LF ..... Recovered Government Archive Solid Waste Facilities List
RGA LUST ..... Recovered Government Archive Leaking Underground Storage Tank

**SURROUNDING SITES: SEARCH RESULTS**

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

**STANDARD ENVIRONMENTAL RECORDS**

***State- and tribal - equivalent CERCLIS***

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 11/03/2014 has revealed that there is

# EXECUTIVE SUMMARY

1 ENVIROSTOR site within approximately 1 mile of the target property.

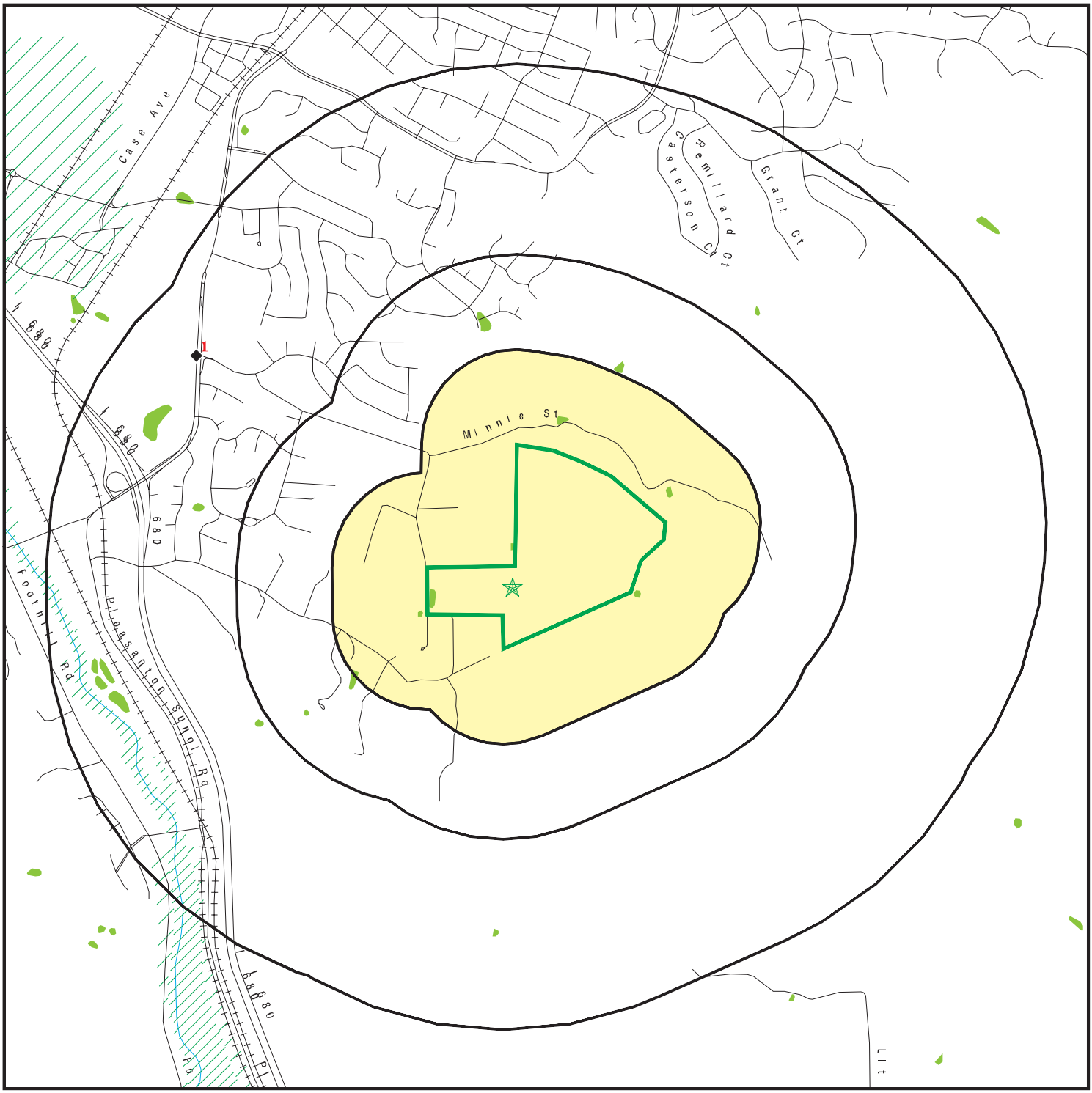
| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***APPLIED BIOSYSTEMS*** | ***6001 SUNOL BOULEVARD*** | ***NW 1/2 - 1 (0.822 mi.)*** | ***1*** | ***8*** |
| Status: Certified / Operation & Maintenance | | | | |

# EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 2 records.

| Site Name | Database(s) |
| --- | --- |
| L-3 RANCH | CA FID UST, SWEEPS UST |
| L-3 RANCH | HIST UST |

# OVERVIEW MAP - 04173137.2R




Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites

0 1/4 1/2 1 Miles

Indian Reservations BIA

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

National Wetland Inventory

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Sportono Ranch | CLIENT: Engeo Inc. |
| ADDRESS: 1000 Minnie Street<br>Pleasanton CA 94566 | CONTACT: Richard Gandolfo<br>INQUIRY #: 04173137.2r |
| LAT/LONG: 37.6359 / 121.8665 | DATE: January 05, 2015 12:43 pm |

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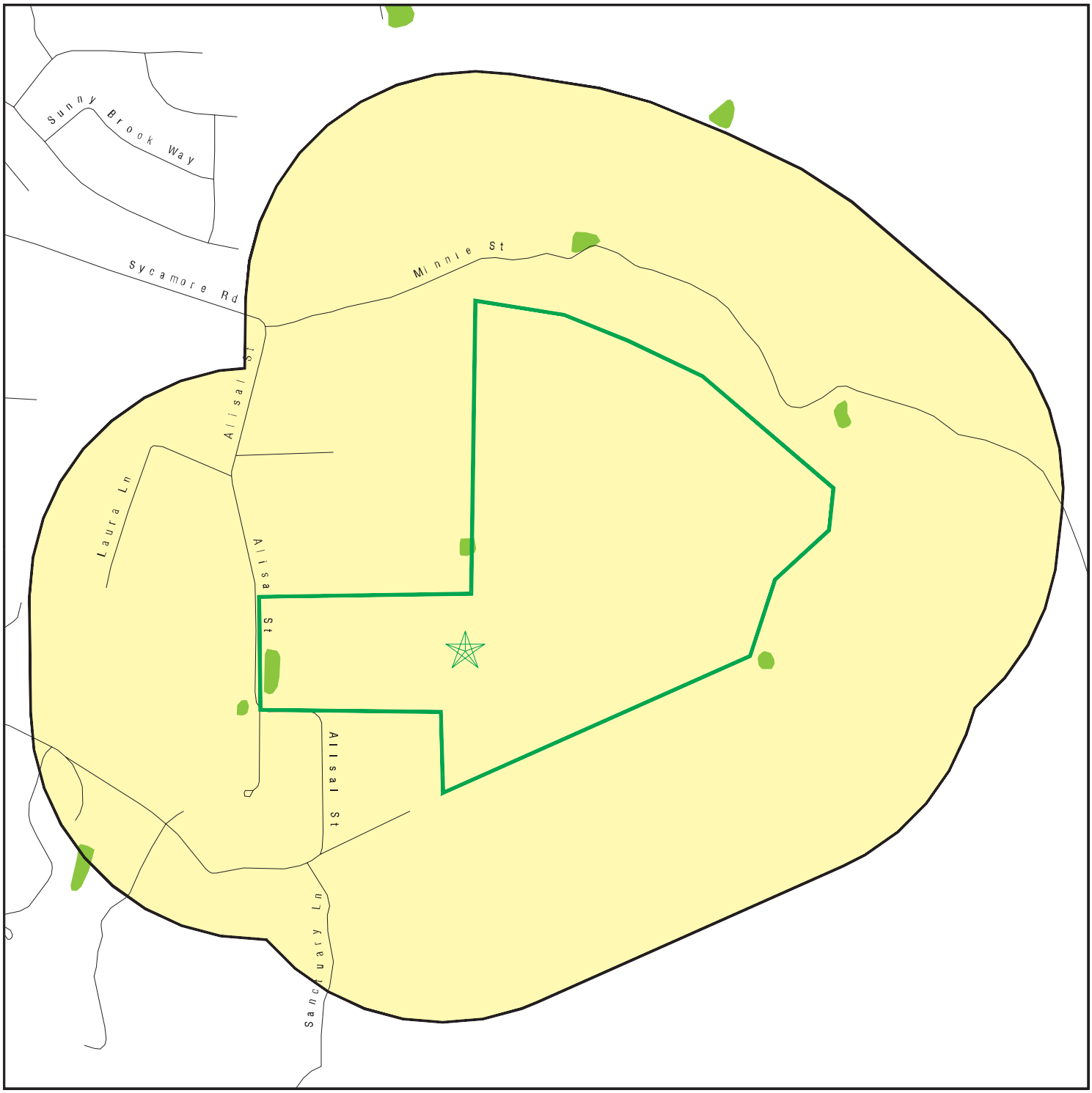
# DETAIL MAP - 04173137.2R




Target Property
Sites at elevations higher than or equal to the target property
Sites at elevations lower than the target property
Manufactured Gas Plants
Sensitive Receptors
National Priority List Sites
Dept. Defense Sites

0 1/8 1/4 1/2 Miles

Indian Reservations BIA
Oil & Gas pipelines from USGS
100-year flood zone
500-year flood zone
National Wetland Inventory

Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

| | |
|---|---|
| SITE NAME: Sportono Ranch | CLIENT: Engeo Inc. |
| ADDRESS: 1000 Minnie Street<br>Pleasanton CA 94566 | CONTACT: Richard Gandolfo<br>INQUIRY #: 04173137.2r |
| LAT/LONG: 37.6359 / 121.8665 | DATE: January 05, 2015 12:48 pm |

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# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| **STANDARD ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Federal NPL site list*** | | | | | | | | |
| NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| Proposed NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPL LIENS | TP | | NR | NR | NR | NR | NR | 0 |
| ***Federal Delisted NPL site list*** | | | | | | | | |
| Delisted NPL | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal CERCLIS list*** | | | | | | | | |
| CERCLIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| FEDERAL FACILITY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal CERCLIS NFRAP site List*** | | | | | | | | |
| CERC-NFRAP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA CORRACTS facilities list*** | | | | | | | | |
| CORRACTS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***Federal RCRA non-CORRACTS TSD facilities list*** | | | | | | | | |
| RCRA-TSDF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal RCRA generators list*** | | | | | | | | |
| RCRA-LQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-SQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| RCRA-CESQG | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Federal institutional controls / engineering controls registries*** | | | | | | | | |
| US ENG CONTROLS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US INST CONTROL | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| LUCIS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Federal ERNS list*** | | | | | | | | |
| ERNS | TP | | NR | NR | NR | NR | NR | 0 |
| ***State- and tribal - equivalent NPL*** | | | | | | | | |
| RESPONSE | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ***State- and tribal - equivalent CERCLIS*** | | | | | | | | |
| ENVIROSTOR | 1.000 | | 0 | 0 | 0 | 1 | NR | 1 |
| ***State and tribal landfill and/or solid waste disposal site lists*** | | | | | | | | |
| SWF/LF | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal leaking storage tank lists*** | | | | | | | | |
| LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| SLIC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Alameda County CS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN LUST | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***State and tribal registered storage tank lists*** | | | | | | | | |
| UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| AST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| INDIAN UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| FEMA UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***State and tribal voluntary cleanup sites*** | | | | | | | | |
| VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| INDIAN VCP | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **ADDITIONAL ENVIRONMENTAL RECORDS** | | | | | | | | |
| ***Local Brownfield lists*** | | | | | | | | |
| US BROWNFIELDS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Landfill / Solid Waste Disposal Sites*** | | | | | | | | |
| ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| DEBRIS REGION 9 | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| SWRCY | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HAULERS | TP | | NR | NR | NR | NR | NR | 0 |
| INDIAN ODI | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| WMUDS/SWAT | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Local Lists of Hazardous waste / Contaminated Sites*** | | | | | | | | |
| US CDL | TP | | NR | NR | NR | NR | NR | 0 |
| HIST Cal-Sites | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCH | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| Toxic Pits | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CDL | TP | | NR | NR | NR | NR | NR | 0 |
| US HIST CDL | TP | | NR | NR | NR | NR | NR | 0 |
| ***Local Lists of Registered Storage Tanks*** | | | | | | | | |
| CA FID UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| HIST UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| SWEEPS UST | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ***Local Land Records*** | | | | | | | | |
| LIENS 2 | TP | | NR | NR | NR | NR | NR | 0 |
| LIENS | TP | | NR | NR | NR | NR | NR | 0 |
| DEED | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| ***Records of Emergency Release Reports*** | | | | | | | | |
| HMIRS | TP | | NR | NR | NR | NR | NR | 0 |
| CHMIRS | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| LDS | TP | | NR | NR | NR | NR | NR | 0 |
| MCS | TP | | NR | NR | NR | NR | NR | 0 |
| SPILLS 90 | TP | | NR | NR | NR | NR | NR | 0 |
| ***Other Ascertainable Records*** | | | | | | | | |
| RCRA NonGen / NLR | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| DOT OPS | TP | | NR | NR | NR | NR | NR | 0 |
| DOD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| FUDS | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| CONSENT | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| ROD | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| UMTRA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| US MINES | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| TRIS | TP | | NR | NR | NR | NR | NR | 0 |
| TSCA | TP | | NR | NR | NR | NR | NR | 0 |
| FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| HIST FTTS | TP | | NR | NR | NR | NR | NR | 0 |
| SSTS | TP | | NR | NR | NR | NR | NR | 0 |
| ICIS | TP | | NR | NR | NR | NR | NR | 0 |
| PADS | TP | | NR | NR | NR | NR | NR | 0 |
| MLTS | TP | | NR | NR | NR | NR | NR | 0 |
| RADINFO | TP | | NR | NR | NR | NR | NR | 0 |
| FINDS | TP | | NR | NR | NR | NR | NR | 0 |
| RAATS | TP | | NR | NR | NR | NR | NR | 0 |
| RMP | TP | | NR | NR | NR | NR | NR | 0 |
| CA BOND EXP. PLAN | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| NPDES | TP | | NR | NR | NR | NR | NR | 0 |
| UIC | TP | | NR | NR | NR | NR | NR | 0 |
| Cortese | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| HIST CORTESE | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| CUPA Listings | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| Notify 65 | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| DRYCLEANERS | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| WIP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| ENF | TP | | NR | NR | NR | NR | NR | 0 |
| HAZNET | TP | | NR | NR | NR | NR | NR | 0 |
| EMI | TP | | NR | NR | NR | NR | NR | 0 |
| INDIAN RESERV | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| SCRD DRYCLEANERS | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| PCB TRANSFORMER | TP | | NR | NR | NR | NR | NR | 0 |
| US FIN ASSUR | TP | | NR | NR | NR | NR | NR | 0 |
| EPA WATCH LIST | TP | | NR | NR | NR | NR | NR | 0 |
| LEAD SMELTERS | TP | | NR | NR | NR | NR | NR | 0 |
| PRP | TP | | NR | NR | NR | NR | NR | 0 |
| 2020 COR ACTION | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| COAL ASH DOE | TP | | NR | NR | NR | NR | NR | 0 |
| HWP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| HWT | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| PROC | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| Financial Assurance | TP | | NR | NR | NR | NR | NR | 0 |
| WDS | TP | | NR | NR | NR | NR | NR | 0 |

# MAP FINDINGS SUMMARY

| Database | Search Distance (Miles) | Target Property | < 1/8 | 1/8 - 1/4 | 1/4 - 1/2 | 1/2 - 1 | > 1 | Total Plotted |
|---|---|---|---|---|---|---|---|---|
| MWMP | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| US AIRS | TP | | NR | NR | NR | NR | NR | 0 |
| COAL ASH EPA | 0.500 | | 0 | 0 | 0 | NR | NR | 0 |
| **EDR HIGH RISK HISTORICAL RECORDS** | | | | | | | | |
| ***EDR Exclusive Records*** | | | | | | | | |
| EDR MGP | 1.000 | | 0 | 0 | 0 | 0 | NR | 0 |
| EDR US Hist Auto Stat | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| EDR US Hist Cleaners | 0.250 | | 0 | 0 | NR | NR | NR | 0 |
| **EDR RECOVERED GOVERNMENT ARCHIVES** | | | | | | | | |
| ***Exclusive Recovered Govt. Archives*** | | | | | | | | |
| RGA LF | TP | | NR | NR | NR | NR | NR | 0 |
| RGA LUST | TP | | NR | NR | NR | NR | NR | 0 |

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

**1 NW 1/2-1 0.822 mi. 4342 ft.** | **APPLIED BIOSYSTEMS 6001 SUNOL BOULEVARD PLEASANTON, CA 94566** | **NPDES DEED VCP ENVIROSTOR WDS** | **S106101766 N/A**

**Relative: Lower**

**Actual: 361 ft.**

NPDES:

| | |
|---|---|
| Npdes Number: | CAS000001 |
| Facility Status: | Active |
| Agency Id: | 0 |
| Region: | 2 |
| Regulatory Measure Id: | 181247 |
| Order No: | 97-03-DWQ |
| Regulatory Measure Type: | Enrollee |
| Place Id: | Not reported |
| WDID: | 2 01I018034 |
| Program Type: | Industrial |
| Adoption Date Of Regulatory Measure: | Not reported |
| Effective Date Of Regulatory Measure: | 04/02/2003 |
| Expiration Date Of Regulatory Measure: | Not reported |
| Termination Date Of Regulatory Measure: | Not reported |
| Discharge Name: | Applied Biosystems |
| Discharge Address: | 6001 Sunol Blvd |
| Discharge City: | Pleasanton |
| Discharge State: | California |
| Discharge Zip: | 94566 |

DEED:

| | |
|---|---|
| Area: | PROJECT WIDE |
| Sub Area: | Not reported |
| Site Type: | VOLUNTARY CLEANUP |
| Status: | CERTIFIED / OPERATION & MAINTENANCE |
| Agency: | Not reported |
| Covenant Uploaded: | Not reported |
| Deed Date(s): | 09/24/2003 |
| EDR Link ID: | 1280050 |

| | |
|---|---|
| Area: | PROJECT WIDE |
| Sub Area: | Not reported |
| Site Type: | VOLUNTARY CLEANUP |
| Status: | CERTIFIED / OPERATION & MAINTENANCE |
| Agency: | Not reported |
| Covenant Uploaded: | Not reported |
| Deed Date(s): | 01/26/2000 |
| EDR Link ID: | 1280050 |

| | |
|---|---|
| Area: | PROJECT WIDE |
| Sub Area: | Not reported |
| Site Type: | VOLUNTARY CLEANUP |
| Status: | CERTIFIED / OPERATION & MAINTENANCE |
| Agency: | Not reported |
| Covenant Uploaded: | Not reported |
| Deed Date(s): | 05/18/1996 |
| EDR Link ID: | 1280050 |

| | |
|---|---|
| Area: | PROJECT WIDE |
| Sub Area: | Not reported |
| Site Type: | VOLUNTARY CLEANUP |
| Status: | CERTIFIED / OPERATION & MAINTENANCE |

**APPLIED BIOSYSTEMS (Continued)** **S106101766**

Agency: Not reported
Covenant Uploaded: Not reported
Deed Date(s): 05/18/1996
EDR Link ID: 1280050

VCP:

| | |
|---|---|
| Facility ID: | 1280050 |
| Site Type: | Voluntary Cleanup |
| Site Type Detail: | Voluntary Cleanup |
| Site Mgmt. Req.: | REM, MON, GW |
| Acres: | 80 |
| National Priorities List: | NO |
| Cleanup Oversight Agencies: | SMBRP |
| Lead Agency: | SMBRP |
| Lead Agency Description: | DTSC - Site Cleanup Program |
| Project Manager: | Jacinto Soto |
| Supervisor: | Karen Toth |
| Division Branch: | Cleanup Berkeley |
| Site Code: | 200240 |
| Assembly: | 16 |
| Senate: | 07 |
| Special Programs Code: | Voluntary Cleanup Program |
| Status: | Certified / Operation & Maintenance |
| Status Date: | 12/12/2003 |
| Restricted Use: | YES |
| Funding: | Responsible Party |
| Lat/Long: | 37.64146 / -121.8819 |
| APN: | 947-5-4-7 |
| Past Use: | MANUFACTURING - OTHER |
| Potential COC: | 30018, 30022, 30024, 3002502 |
| Confirmed COC: | 30018,30022,30024,3002502 |
| Potential Description: | OTH, SOIL |
| Alias Name: | Not reported |
| Alias Type: | Not reported |

Completed Info:

| | |
|---|---|
| Completed Area Name: | Not reported |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Not reported |
| Completed Date: | Not reported |
| Comments: | Not reported |
| Future Area Name: | Not reported |
| Future Sub Area Name: | Not reported |
| Future Document Type: | Not reported |
| Future Due Date: | Not reported |
| Schedule Area Name: | Not reported |
| Schedule Sub Area Name: | Not reported |
| Schedule Document Type: | Not reported |
| Schedule Due Date: | Not reported |
| Schedule Revised Date: | Not reported |

ENVIROSTOR:

| | |
|---|---|
| Facility ID: | 1280050 |
| Status: | Certified / Operation & Maintenance |
| Status Date: | 12/12/2003 |
| Site Code: | 200240 |

**APPLIED BIOSYSTEMS (Continued)** **S106101766**

| | |
|---|---|
| Site Type: | Voluntary Cleanup |
| Site Type Detailed: | Voluntary Cleanup |
| Acres: | 80 |
| NPL: | NO |
| Regulatory Agencies: | SMBRP |
| Lead Agency: | SMBRP |
| Program Manager: | Jacinto Soto |
| Supervisor: | Karen Toth |
| Division Branch: | Cleanup Berkeley |
| Assembly: | 16 |
| Senate: | 07 |
| Special Program: | Voluntary Cleanup Program |
| Restricted Use: | YES |
| Site Mgmt Req: | REM, MON, GW |
| Funding: | Responsible Party |
| Latitude: | 37.64146 |
| Longitude: | -121.8819 |
| APN: | 947-5-4-7 |
| Past Use: | MANUFACTURING - OTHER |
| Potential COC: | Polychlorinated biphenyls (PCBs Tetrachloroethylene (PCE TPH-diesel TPH-MOTOR OIL |
| Confirmed COC: | Polychlorinated biphenyls (PCBs Tetrachloroethylene (PCE TPH-diesel TPH-MOTOR OIL |
| Potential Description: | OTH, SOIL |
| Alias Name: | Not reported |
| Alias Type: | Not reported |

Completed Info:

| | |
|---|---|
| Completed Area Name: | Not reported |
| Completed Sub Area Name: | Not reported |
| Completed Document Type: | Not reported |
| Completed Date: | Not reported |
| Comments: | Not reported |
| Future Area Name: | Not reported |
| Future Sub Area Name: | Not reported |
| Future Document Type: | Not reported |
| Future Due Date: | Not reported |
| Schedule Area Name: | Not reported |
| Schedule Sub Area Name: | Not reported |
| Schedule Document Type: | Not reported |
| Schedule Due Date: | Not reported |
| Schedule Revised Date: | Not reported |

CA WDS:

| | |
|---|---|
| Facility ID: | San Francisco Bay 01I018034 |
| Facility Type: | Industrial - Facility that treats and/or disposes of liquid or semisolid wastes from any servicing, producing, manufacturing or processing operation of whatever nature, including mining, gravel washing, geothermal operations, air conditioning, ship building and repairing, oil production, storage and disposal operations, water pumping. |
| Facility Status: | Active - Any facility with a continuous or seasonal discharge that is under Waste Discharge Requirements. |
| NPDES Number: | CAS000001 The 1st 2 characters designate the state. The remaining 7 are assigned by the Regional Board |
| Subregion: | 2 |

**APPLIED BIOSYSTEMS (Continued)** **S106101766**

| | |
|---|---|
| Facility Telephone: | 6505706667 |
| Facility Contact: | MILES MERETE K |
| Agency Name: | APPLIED BIOSTYSTEMS APPLERA CO |
| Agency Address: | 850 Lincoln Centre Dr |
| Agency City,St,Zip: | Foster City 944041128 |
| Agency Contact: | MILES MERETE K |
| Agency Telephone: | 6505706667 |
| Agency Type: | Private |
| SIC Code: | 0 |
| SIC Code 2: | Not reported |
| Primary Waste Type: | Not reported |
| Primary Waste: | Not reported |
| Waste Type2: | Not reported |
| Waste2: | Not reported |
| Primary Waste Type: | Not reported |
| Secondary Waste: | Not reported |
| Secondary Waste Type: | Not reported |
| Design Flow: | 0 |
| Baseline Flow: | 0 |
| Reclamation: | Not reported |
| POTW: | Not reported |
| Treat To Water: | Minor Threat to Water Quality. A violation of a regional board order should cause a relatively minor impairment of beneficial uses compared to a major or minor threat. Not: All nurds without a TTWQ will be considered a minor threat to water quality unless coded at a higher Level. A Zero (0) may be used to code those NURDS that are found to represent no threat to water quality. |
| Complexity: | Category C - Facilities having no waste treatment systems, such as cooling water dischargers or thosewho must comply through best management practices, facilities with passive waste treatment and disposal systems, such as septic systems with subsurface disposal, or dischargers having waste storage systems with land disposal such as dairy waste ponds. |

Count: 2 records.

ORPHAN SUMMARY

| City | EDR ID | Site Name | Site Address | Zip | Database(s) |
|---|---|---|---|---|---|
| PLEASANTON | U001598045 | L-3 RANCH | 1500 MINNIE ST. | 94566 | HIST UST |
| PLEASANTON | S101624072 | L-3 RANCH | 1500 MINNIE ST | 94566 | CA FID UST, SWEEPS UST |

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

**Number of Days to Update:** Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

## STANDARD ENVIRONMENTAL RECORDS

### *Federal NPL site list*

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 10/08/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 40

Source: EPA
Telephone: N/A
Last EDR Contact: 10/08/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 10/08/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 40

Source: EPA
Telephone: N/A
Last EDR Contact: 10/08/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

***Federal Delisted NPL site list***

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

| | |
|---|---|
| Date of Government Version: 09/29/2014 | Source: EPA |
| Date Data Arrived at EDR: 10/08/2014 | Telephone: N/A |
| Date Made Active in Reports: 11/17/2014 | Last EDR Contact: 10/08/2014 |
| Number of Days to Update: 40 | Next Scheduled EDR Contact: 01/19/2015 |
| | Data Release Frequency: Quarterly |

***Federal CERCLIS list***

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

| | |
|---|---|
| Date of Government Version: 10/25/2013 | Source: EPA |
| Date Data Arrived at EDR: 11/11/2013 | Telephone: 703-412-9810 |
| Date Made Active in Reports: 02/13/2014 | Last EDR Contact: 11/24/2014 |
| Number of Days to Update: 94 | Next Scheduled EDR Contact: 03/09/2015 |
| | Data Release Frequency: Quarterly |

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

| | |
|---|---|
| Date of Government Version: 07/21/2014 | Source: Environmental Protection Agency |
| Date Data Arrived at EDR: 10/07/2014 | Telephone: 703-603-8704 |
| Date Made Active in Reports: 10/20/2014 | Last EDR Contact: 10/07/2014 |
| Number of Days to Update: 13 | Next Scheduled EDR Contact: 01/19/2015 |
| | Data Release Frequency: Varies |

***Federal CERCLIS NFRAP site List***

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

| | |
|---|---|
| Date of Government Version: 10/25/2013 | Source: EPA |
| Date Data Arrived at EDR: 11/11/2013 | Telephone: 703-412-9810 |
| Date Made Active in Reports: 02/13/2014 | Last EDR Contact: 11/24/2014 |
| Number of Days to Update: 94 | Next Scheduled EDR Contact: 03/09/2015 |
| | Data Release Frequency: Quarterly |

***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

***Federal institutional controls / engineering controls registries***

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 09/18/2014
Date Data Arrived at EDR: 09/19/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/03/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 09/18/2014
Date Data Arrived at EDR: 09/19/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 12/03/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/29/2014
Date Data Arrived at EDR: 10/09/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 11

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Varies

***Federal ERNS list***

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 09/30/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 37

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Annually

***State- and tribal - equivalent NPL***

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/04/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Quarterly

***State- and tribal - equivalent CERCLIS***

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/04/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Quarterly

***State and tribal landfill and/or solid waste disposal site lists***

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 11/17/2014
Date Data Arrived at EDR: 11/19/2014
Date Made Active in Reports: 12/24/2014
Number of Days to Update: 35

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Quarterly

***State and tribal leaking storage tank lists***

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/30/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List
Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List
Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/30/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 46

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/20/2014
Date Data Arrived at EDR: 06/10/2014
Date Made Active in Reports: 08/22/2014
Number of Days to Update: 73

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 11/04/2014
Date Data Arrived at EDR: 11/07/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 10

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 05/22/2014
Date Data Arrived at EDR: 08/22/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 27

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 10/06/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 19

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 07/30/2014
Date Data Arrived at EDR: 08/12/2014
Date Made Active in Reports: 08/22/2014
Number of Days to Update: 10

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/31/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/05/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 12

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

***State and tribal registered storage tank lists***

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/17/2014
Date Data Arrived at EDR: 09/17/2014
Date Made Active in Reports: 10/24/2014
Number of Days to Update: 37

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/23/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/05/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 12

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 10/06/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 8

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Semi-Annually

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 07/30/2014
Date Data Arrived at EDR: 08/12/2014
Date Made Active in Reports: 08/22/2014
Number of Days to Update: 10

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/31/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 08/20/2014
Date Data Arrived at EDR: 08/22/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 27

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/20/2014
Date Data Arrived at EDR: 06/10/2014
Date Made Active in Reports: 08/15/2014
Number of Days to Update: 66

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 08/14/2014
Date Data Arrived at EDR: 08/15/2014
Date Made Active in Reports: 08/22/2014
Number of Days to Update: 7

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 11/04/2014
Date Data Arrived at EDR: 11/07/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 10

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Varies

***State and tribal voluntary cleanup sites***

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 10/01/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 36

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/31/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/04/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Quarterly

**ADDITIONAL ENVIRONMENTAL RECORDS**

***Local Brownfield lists***

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/22/2014
Date Data Arrived at EDR: 09/23/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/22/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Semi-Annually

***Local Lists of Landfill / Solid Waste Disposal Sites***

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/24/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/16/2014
Date Data Arrived at EDR: 09/17/2014
Date Made Active in Reports: 10/23/2014
Number of Days to Update: 36

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 09/08/2014
Date Data Arrived at EDR: 09/09/2014
Date Made Active in Reports: 10/22/2014
Number of Days to Update: 43

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 11/12/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 10/29/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: No Update Planned

***Local Lists of Hazardous waste / Contaminated Sites***

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/25/2014
Date Data Arrived at EDR: 09/09/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 41

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/04/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2014
Date Data Arrived at EDR: 09/02/2014
Date Made Active in Reports: 09/24/2014
Number of Days to Update: 22

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 07/25/2014
Date Data Arrived at EDR: 09/09/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 41

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: No Update Planned

***Local Lists of Registered Storage Tanks***

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 12/24/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Local Land Records***

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 10/02/2014
Date Data Arrived at EDR: 10/03/2014
Date Made Active in Reports: 11/20/2014
Number of Days to Update: 48

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 12/05/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 09/08/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/22/2014
Number of Days to Update: 42

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/09/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Semi-Annually

***Records of Emergency Release Reports***

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 09/30/2014
Date Data Arrived at EDR: 10/01/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 36

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 12/30/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 10/27/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 12/10/2014
Number of Days to Update: 42

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/29/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/30/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 43

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/30/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 43

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

***Other Ascertainable Records***

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 07/02/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/04/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 06/06/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 09/18/2014
Number of Days to Update: 8

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 12/12/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 12/24/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/12/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/05/2014
Date Data Arrived at EDR: 09/04/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 74

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 12/30/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/22/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/31/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 33

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/15/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 12/04/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 10/07/2014
Date Data Arrived at EDR: 10/08/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 12

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/08/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 08/16/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/09/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2014
Date Data Arrived at EDR: 08/12/2014
Date Made Active in Reports: 11/06/2014
Number of Days to Update: 86

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 11/17/2014
Date Data Arrived at EDR: 11/19/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 40

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Quarterly

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 07/14/2014
Date Data Arrived at EDR: 09/17/2014
Date Made Active in Reports: 10/23/2014
Number of Days to Update: 36

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 09/29/2014
Date Data Arrived at EDR: 09/30/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 50

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/18/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 06/28/2014
Date Data Arrived at EDR: 07/03/2014
Date Made Active in Reports: 08/21/2014
Number of Days to Update: 49

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 12/22/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Annually

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 12/23/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 11/10/2014
Date Data Arrived at EDR: 11/12/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 30

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 35

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/15/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 03/25/2014
Date Made Active in Reports: 04/28/2014
Number of Days to Update: 34

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/24/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/18/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: N/A

WDS: Waste Discharge System

Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/14/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Varies

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/29/2015
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 06/04/2014
Date Data Arrived at EDR: 06/12/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 10/06/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Varies

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/14/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/16/2014
Date Data Arrived at EDR: 09/17/2014
Date Made Active in Reports: 10/23/2014
Number of Days to Update: 36

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 10/31/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/30/2014
Date Made Active in Reports: 12/10/2014
Number of Days to Update: 41

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 11/17/2014
Date Data Arrived at EDR: 11/18/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 41

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/12/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 08/20/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/23/2014
Number of Days to Update: 43

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/09/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 10/17/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Varies

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 10/14/2014
Date Data Arrived at EDR: 10/15/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/15/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Quarterly

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/16/2014
Date Data Arrived at EDR: 10/31/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 17

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/23/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/16/2014
Date Data Arrived at EDR: 10/31/2014
Date Made Active in Reports: 11/17/2014
Number of Days to Update: 17

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 12/23/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Annually

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 09/04/2014
Date Data Arrived at EDR: 09/04/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 11/11/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Quarterly

## EDR HIGH RISK HISTORICAL RECORDS

### *EDR Exclusive Records*

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

## EDR RECOVERED GOVERNMENT ARCHIVES

### *Exclusive Recovered Govt. Archives*

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

**COUNTY RECORDS**

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 10/21/2014
Date Data Arrived at EDR: 11/07/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 35

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/21/2014
Date Data Arrived at EDR: 11/07/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 38

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 09/08/2014
Date Data Arrived at EDR: 09/09/2014
Date Made Active in Reports: 09/24/2014
Number of Days to Update: 15

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 12/05/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 20

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 11/06/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 10/06/2014
Date Data Arrived at EDR: 10/07/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 43

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/11/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 24

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/11/2014
Date Data Arrived at EDR: 08/14/2014
Date Made Active in Reports: 10/09/2014
Number of Days to Update: 56

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 11/03/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 11/03/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/19/2014
Date Data Arrived at EDR: 11/21/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 38

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 11/03/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 09/30/2014
Date Data Arrived at EDR: 10/14/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 36

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 09/10/2014
Date Data Arrived at EDR: 09/11/2014
Date Made Active in Reports: 09/25/2014
Number of Days to Update: 14

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 11/03/2014
Date Data Arrived at EDR: 11/04/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 38

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 07/22/2014
Date Data Arrived at EDR: 11/12/2014
Date Made Active in Reports: 12/19/2014
Number of Days to Update: 37

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 11/21/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 35

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 11/21/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/23/2014
Date Data Arrived at EDR: 07/25/2014
Date Made Active in Reports: 08/22/2014
Number of Days to Update: 28

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/20/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 12/18/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 03/31/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/17/2014
Number of Days to Update: 41

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/14/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/20/2014
Date Data Arrived at EDR: 10/22/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 51

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/22/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 10/17/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/25/2014
Number of Days to Update: 28

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/17/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 10/20/2014
Date Data Arrived at EDR: 10/22/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 54

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/20/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 07/28/2014
Date Data Arrived at EDR: 07/28/2014
Date Made Active in Reports: 08/20/2014
Number of Days to Update: 23

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/13/2014
Date Data Arrived at EDR: 03/27/2014
Date Made Active in Reports: 04/28/2014
Number of Days to Update: 32

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 10/02/2014
Date Data Arrived at EDR: 10/03/2014
Date Made Active in Reports: 11/20/2014
Number of Days to Update: 48

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 10/08/2014
Date Data Arrived at EDR: 10/22/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 54

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 10/20/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 33

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 11/21/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 09/02/2014
Date Data Arrived at EDR: 09/05/2014
Date Made Active in Reports: 09/24/2014
Number of Days to Update: 19

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 28

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 09/16/2014
Date Data Arrived at EDR: 09/18/2014
Date Made Active in Reports: 09/25/2014
Number of Days to Update: 7

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/01/2014
Date Data Arrived at EDR: 11/12/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 30

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/01/2014
Date Data Arrived at EDR: 11/12/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 30

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/01/2014
Date Data Arrived at EDR: 11/10/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 35

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/10/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/22/2014
Date Data Arrived at EDR: 09/23/2014
Date Made Active in Reports: 11/21/2014
Number of Days to Update: 59

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 12/05/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/08/2014
Date Data Arrived at EDR: 10/10/2014
Date Made Active in Reports: 11/20/2014
Number of Days to Update: 41

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/22/2014
Next Scheduled EDR Contact: 01/05/2015
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/08/2014
Date Data Arrived at EDR: 10/10/2014
Date Made Active in Reports: 11/25/2014
Number of Days to Update: 46

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/22/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/06/2014
Date Data Arrived at EDR: 04/08/2014
Date Made Active in Reports: 04/29/2014
Number of Days to Update: 21

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/06/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 10/21/2014
Date Data Arrived at EDR: 10/28/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 48

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/21/2014
Next Scheduled EDR Contact: 01/19/2015
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 08/06/2014
Date Data Arrived at EDR: 08/07/2014
Date Made Active in Reports: 09/30/2014
Number of Days to Update: 54

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/10/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/04/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2014
Date Data Arrived at EDR: 11/21/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 38

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 12/04/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/20/2014
Date Data Arrived at EDR: 06/23/2014
Date Made Active in Reports: 07/11/2014
Number of Days to Update: 18

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/18/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/21/2014
Date Data Arrived at EDR: 11/24/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 36

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/21/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 10/06/2014
Date Data Arrived at EDR: 10/10/2014
Date Made Active in Reports: 11/19/2014
Number of Days to Update: 40

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/15/2014
Date Data Arrived at EDR: 09/16/2014
Date Made Active in Reports: 10/22/2014
Number of Days to Update: 36

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/11/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 11/19/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 11/25/2014
Date Data Arrived at EDR: 11/26/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 34

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 11/21/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/25/2014
Next Scheduled EDR Contact: 03/16/2015
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/10/2014
Date Data Arrived at EDR: 11/10/2014
Date Made Active in Reports: 12/15/2014
Number of Days to Update: 35

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 11/07/2014
Next Scheduled EDR Contact: 02/23/2015
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 11/24/2014
Date Data Arrived at EDR: 11/25/2014
Date Made Active in Reports: 12/31/2014
Number of Days to Update: 36

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/21/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 09/16/2014
Date Data Arrived at EDR: 09/18/2014
Date Made Active in Reports: 10/22/2014
Number of Days to Update: 34

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2014
Date Data Arrived at EDR: 06/26/2014
Date Made Active in Reports: 07/25/2014
Number of Days to Update: 29

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/11/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2014
Date Data Arrived at EDR: 06/26/2014
Date Made Active in Reports: 07/25/2014
Number of Days to Update: 29

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/11/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 09/30/2014
Date Data Arrived at EDR: 10/02/2014
Date Made Active in Reports: 11/20/2014
Number of Days to Update: 49

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites
A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 10/01/2014
Date Data Arrived at EDR: 10/03/2014
Date Made Active in Reports: 11/20/2014
Number of Days to Update: 48

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 12/29/2014
Next Scheduled EDR Contact: 04/13/2015
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks
Underground storage tank sites located in Sutter county.

Date of Government Version: 09/08/2014
Date Data Arrived at EDR: 09/09/2014
Date Made Active in Reports: 10/24/2014
Number of Days to Update: 45

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/05/2014
Next Scheduled EDR Contact: 03/23/2015
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/28/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 44

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 10/29/2014
Date Data Arrived at EDR: 11/24/2014
Date Made Active in Reports: 12/29/2014
Number of Days to Update: 35

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites
Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/03/2014
Next Scheduled EDR Contact: 01/12/2015
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 09/26/2014
Date Data Arrived at EDR: 10/29/2014
Date Made Active in Reports: 12/12/2014
Number of Days to Update: 44

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/27/2014
Next Scheduled EDR Contact: 02/09/2015
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/26/2014
Date Data Arrived at EDR: 09/17/2014
Date Made Active in Reports: 10/28/2014
Number of Days to Update: 41

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/15/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 09/23/2014
Date Data Arrived at EDR: 09/30/2014
Date Made Active in Reports: 11/25/2014
Number of Days to Update: 56

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 12/18/2014
Next Scheduled EDR Contact: 04/06/2015
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 11/17/2014
Date Data Arrived at EDR: 11/18/2014
Date Made Active in Reports: 12/30/2014
Number of Days to Update: 42

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Varies

**OTHER DATABASE(S)**

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/17/2014
Next Scheduled EDR Contact: 03/02/2015
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/10/2014
Next Scheduled EDR Contact: 01/26/2015
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2014
Date Data Arrived at EDR: 11/05/2014
Date Made Active in Reports: 11/24/2014
Number of Days to Update: 19

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/05/2014
Next Scheduled EDR Contact: 02/16/2015
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/21/2014
Date Made Active in Reports: 08/25/2014
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/20/2014
Next Scheduled EDR Contact: 02/02/2015
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 07/15/2014
Date Made Active in Reports: 08/13/2014
Number of Days to Update: 29

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/26/2014
Next Scheduled EDR Contact: 03/09/2015
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/20/2014
Date Made Active in Reports: 08/07/2014
Number of Days to Update: 48

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/12/2014
Next Scheduled EDR Contact: 03/30/2015
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

**STREET AND ADDRESS INFORMATION**

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# GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

**TARGET PROPERTY ADDRESS**

SPORTONO RANCH
1000 MINNIE STREET
PLEASANTON, CA 94566

**TARGET PROPERTY COORDINATES**

| | |
|---|---|
| Latitude (North): | 37.6359 - 37˚ 38' 9.24'' |
| Longitude (West): | 121.8665 - 121˚ 51' 59.40'' |
| Universal Tranverse Mercator: | Zone 10 |
| UTM X (Meters): | 600012.4 |
| UTM Y (Meters): | 4165818.0 |
| Elevation: | 404 ft. above sea level |

**USGS TOPOGRAPHIC MAP**

| | |
|---|---|
| Target Property Map: | 37121-F7 LIVERMORE, CA |
| Most Recent Revision: | 1980 |
| South Map: | 37121-E7 LA COSTA VALLEY, CA |
| Most Recent Revision: | 1999 |
| Southwest Map: | 37121-E8 NILES, CA |
| Most Recent Revision: | 1980 |
| West Map: | 37121-F8 DUBLIN, CA |
| Most Recent Revision: | 1980 |

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW DIRECTION INFORMATION**

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

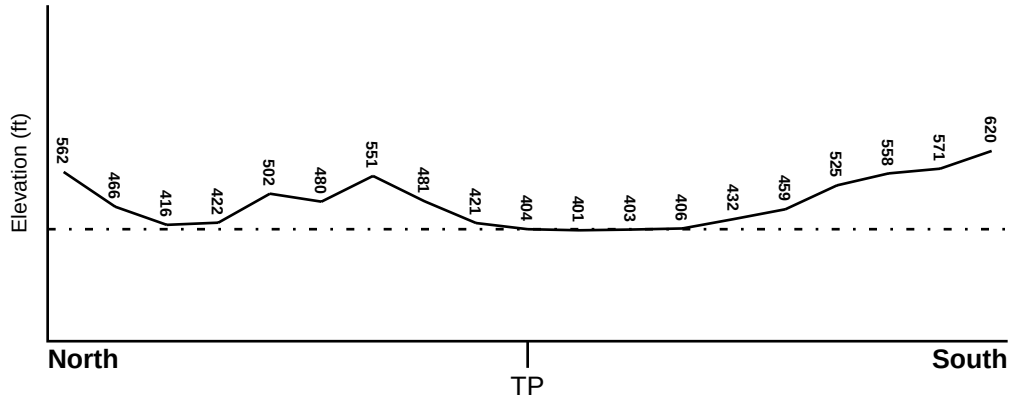
**TOPOGRAPHIC INFORMATION**

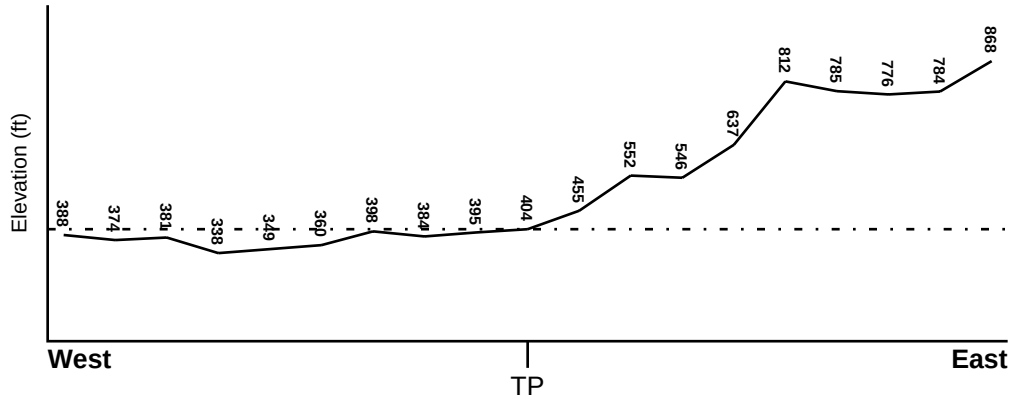
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

**TARGET PROPERTY TOPOGRAPHY**

General Topographic Gradient: General SW

**SURROUNDING TOPOGRAPHY: ELEVATION PROFILES**




**Target Property Elevation: 404 ft.**

0 1/2 1 Miles

Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**HYDROLOGIC INFORMATION**

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

**FEMA FLOOD ZONE**

| Target Property County | FEMA Flood Electronic Data |
|---|---|
| ALAMEDA, CA | YES - refer to the Overview Map and Detail Map |

Flood Plain Panel at Target Property: 06001C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

**NATIONAL WETLAND INVENTORY**

| NWI Quad at Target Property | NWI Electronic Data Coverage |
|---|---|
| LIVERMORE | YES - refer to the Overview Map and Detail Map |

**HYDROGEOLOGIC INFORMATION**

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

***Site-Specific Hydrogeological Data*:***

Search Radius: 1.25 miles
Status: Not found

**AQUIFLOW®**

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

| MAP ID | LOCATION FROM TP | GENERAL DIRECTION GROUNDWATER FLOW |
|---|---|---|
| Not Reported | | |

* ©1996 Site−specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**GROUNDWATER FLOW VELOCITY INFORMATION**

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

**GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY**

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

**ROCK STRATIGRAPHIC UNIT**

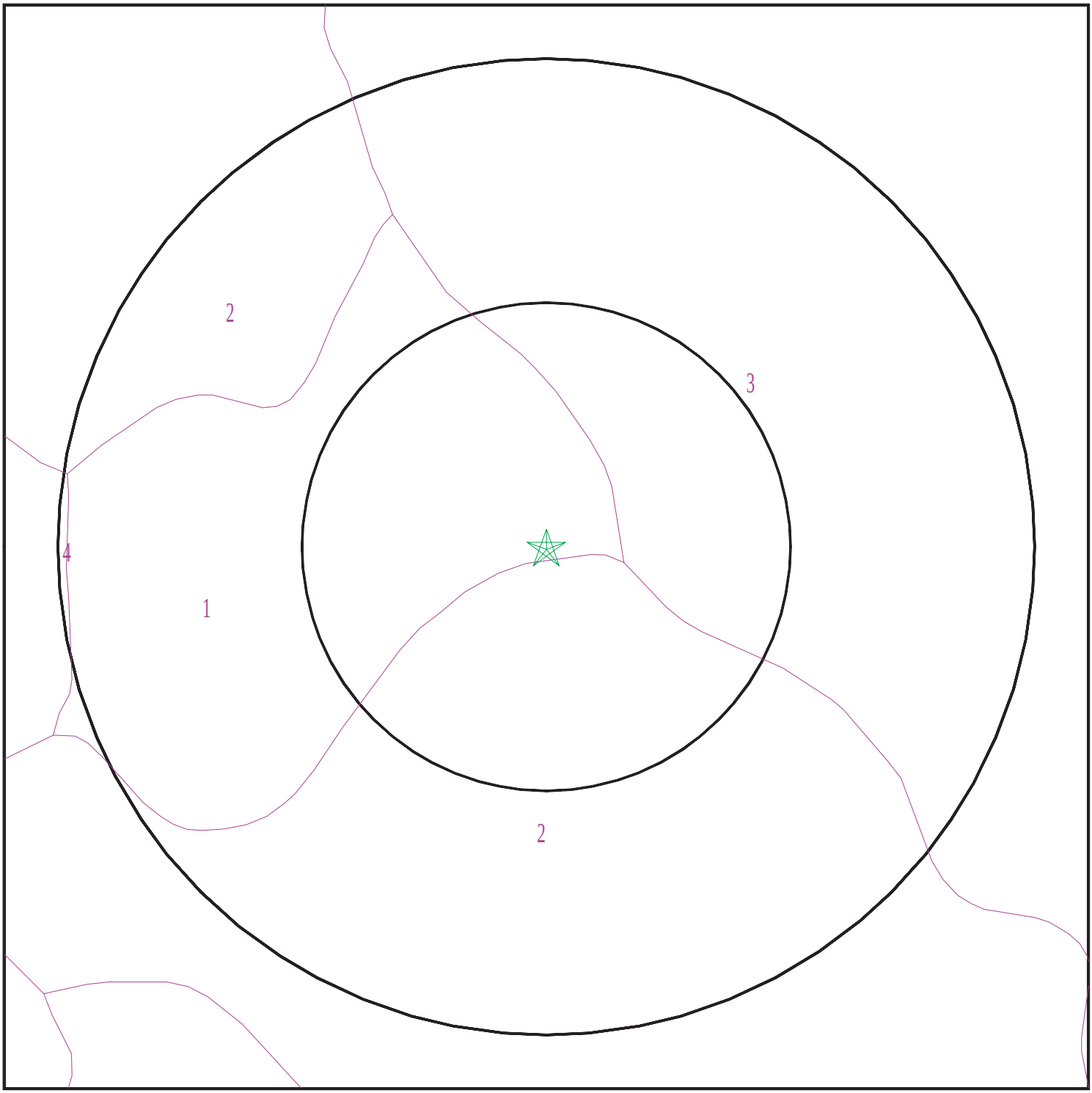
| | |
|---|---|
| Era: | Cenozoic |
| System: | Tertiary |
| Series: | Miocene |
| Code: | Tm *(decoded above as Era, System & Series)* |

**GEOLOGIC AGE IDENTIFICATION**

Category: Stratified Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

# SSURGO SOIL MAP - 04173137.2r




Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

| | |
|---|---|
| SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton CA 94566<br>LAT/LONG: 37.6359 / 121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY #: 04173137.2r<br>DATE: January 05, 2015 12:49 pm |

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# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY**

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

---

**Soil Map ID: 1**

Soil Component Name: Rincon

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 16 inches | loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 4 Min: 1.4 | Max: 7.3 Min: 6.6 |
| 2 | 16 inches | 31 inches | sandy clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 1.4 Min: 0.42 | Max: 7.8 Min: 6.6 |
| 3 | 31 inches | 59 inches | stratified sandy loam to clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 4 Min: 1.4 | Max: 8.4 Min: 7.4 |

**Soil Map ID: 2**

Soil Component Name: Pleasanton

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 20 inches | gravelly loam | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 14<br>Min: 4 | Max: 7.3<br>Min: 6.1 |
| 2 | 20 inches | 64 inches | gravelly clay loam | Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 4<br>Min: 1.4 | Max: 7.3<br>Min: 6.1 |
| 3 | 64 inches | 72 inches | gravelly silt loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 4<br>Min: 1.4 | Max: 7.8<br>Min: 7.4 |

**Soil Map ID: 3**

Soil Component Name: Linne

Soil Surface Texture: clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 35 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 4 Min: 1.4 | Max: 8.4 Min: 7.9 |
| 2 | 35 inches | 40 inches | weathered bedrock | Not reported | Not reported | Max: 0 Min: 0 | Max: Min: |

---

**Soil Map ID: 4**

Soil Component Name: Positas

Soil Surface Texture: gravelly loam

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 1 | 0 inches | 11 inches | gravelly loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt. | Max: 14 Min: 4 | Max: 6 Min: 5.6 |

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

| Soil Layer Information | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Boundary | | | Classification | | Saturated hydraulic conductivity micro m/sec | Soil Reaction (pH) |
| Layer | Upper | Lower | Soil Texture Class | AASHTO Group | Unified Soil | | |
| 2 | 11 inches | 29 inches | clay | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 0.42<br>Min: 0.01 | Max: 7.8<br>Min: 5.6 |
| 3 | 29 inches | 53 inches | clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay | Max: 4<br>Min: 1.4 | Max: 8.4<br>Min: 7.9 |
| 4 | 53 inches | 59 inches | gravelly sandy clay loam | Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils. | COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. | Max: 1.4<br>Min: 0.42 | Max: 7.8<br>Min: 7.4 |

## LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

## WELL SEARCH DISTANCE INFORMATION

| DATABASE | SEARCH DISTANCE (miles) |
|---|---|
| Federal USGS | 1.000 |
| Federal FRDS PWS | Nearest PWS within 1 mile |
| State Database | 1.000 |

## FEDERAL USGS WELL INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | USGS40000184347 | 1/4 - 1/2 Mile NW |
| 2 | USGS40000184367 | 1/2 - 1 Mile NW |

## FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|

# GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

**FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No PWS System Found | | |

Note: PWS System location is not always the same as well location.

**STATE DATABASE WELL INFORMATION**

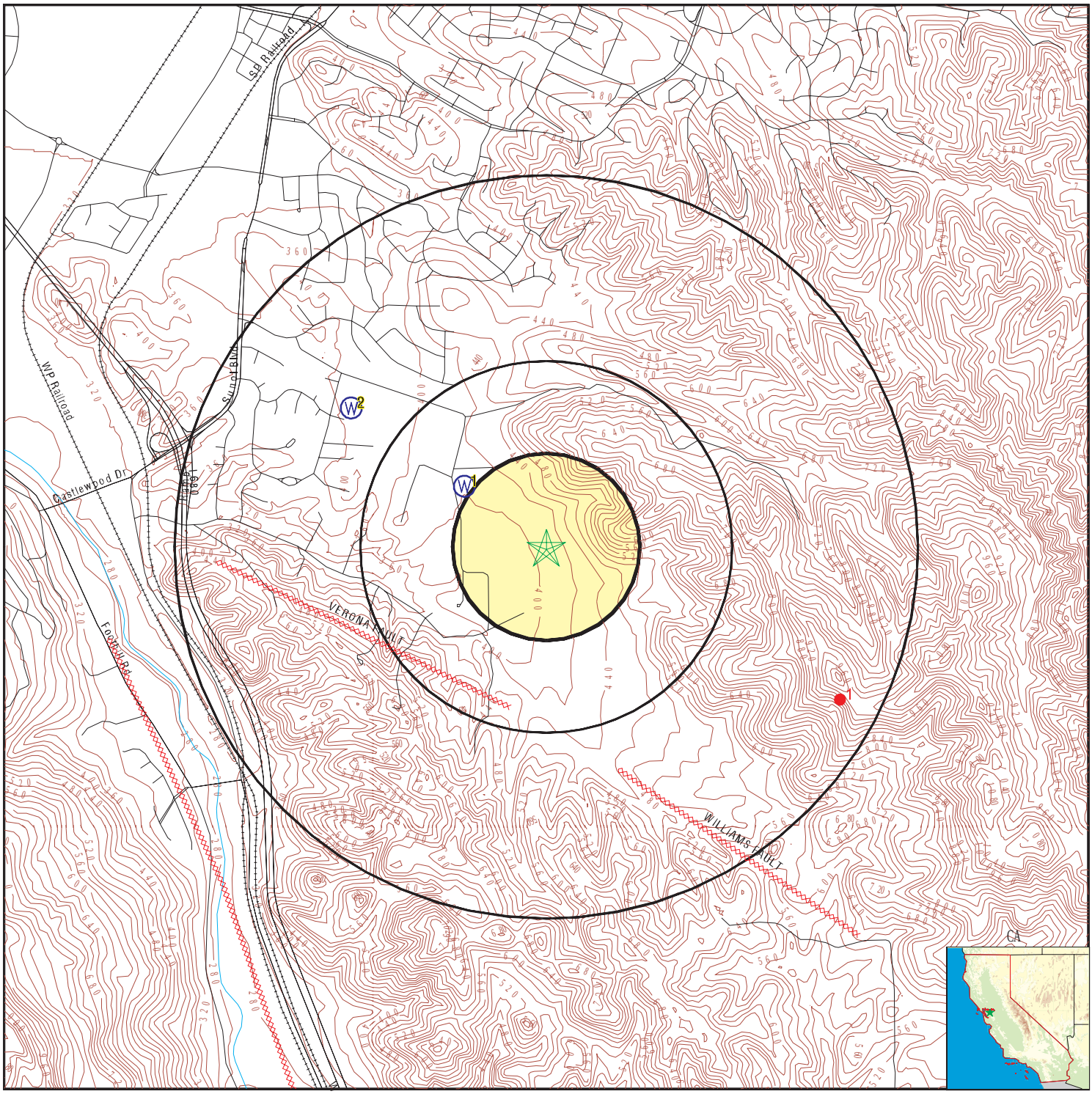
| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| No Wells Found | | |

**OTHER STATE DATABASE INFORMATION**

**STATE OIL/GAS WELL INFORMATION**

| MAP ID | WELL ID | LOCATION FROM TP |
|---|---|---|
| 1 | CAOG9A000206814 | 1/2 - 1 Mile ESE |

# PHYSICAL SETTING SOURCE MAP - 04173137.2r




County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

0 1/4 1/2 1 Miles

Groundwater Flow Direction
GI Indeterminate Groundwater Flow at Location
GV Groundwater Flow Varies at Location
HD Closest Hydrogeological Data
Oil, gas or related wells

N

| | |
|---|---|
| SITE NAME: Sportono Ranch | CLIENT: Engeo Inc. |
| ADDRESS: 1000 Minnie Street<br>Pleasanton CA 94566 | CONTACT: Richard Gandolfo<br>INQUIRY #: 04173137.2r |
| LAT/LONG: 37.6359 / 121.8665 | DATE: January 05, 2015 12:49 pm |

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| Map ID<br>Direction<br>Distance<br>Elevation | Database | EDR ID Number |
|---|---|---|
| **1**<br>**NW**<br>**1/4 - 1/2 Mile**<br>**Lower** | **FED USGS** | **USGS40000184347** |

| | | | |
|---|---|---|---|
| Org. Identifier: | USGS-CA | | |
| Formal name: | USGS California Water Science Center | | |
| Monloc Identifier: | USGS-373818121521001 | | |
| Monloc name: | 003S001E28P081M | | |
| Monloc type: | Well | | |
| Monloc desc: | Not Reported | | |
| Huc code: | 18050004 | Drainagearea value: | Not Reported |
| Drainagearea Units: | Not Reported | Contrib drainagearea: | Not Reported |
| Contrib drainagearea units: | Not Reported | Latitude: | 37.6382653 |
| Longitude: | -121.8705121 | Sourcemap scale: | Not Reported |
| Horiz Acc measure: | Unknown | Horiz Acc measure units: | Unknown |
| Horiz Collection method: | Interpolated from map | | |
| Horiz coord refsys: | NAD83 | Vert measure val: | Not Reported |
| Vert measure units: | Not Reported | Vertacc measure val: | Not Reported |
| Vert accmeasure units: | Not Reported | | |
| Vertcollection method: | Not Reported | | |
| Vert coord refsys: | Not Reported | Countrycode: | US |
| Aquifername: | California Coastal Basin aquifers | | |
| Formation type: | Not Reported | | |
| Aquifer type: | Not Reported | | |
| Construction date: | Not Reported | Welldepth: | Not Reported |
| Welldepth units: | Not Reported | Wellholedepth: | Not Reported |
| Wellholedepth units: | Not Reported | | |

Ground-water levels, Number of Measurements: 0

---

| | | |
|---|---|---|
| **2**<br>**NW**<br>**1/2 - 1 Mile**<br>**Lower** | **FED USGS** | **USGS40000184367** |

| | | | |
|---|---|---|---|
| Org. Identifier: | USGS-CA | | |
| Formal name: | USGS California Water Science Center | | |
| Monloc Identifier: | USGS-373829121523001 | | |
| Monloc name: | 003S001E28L001M | | |
| Monloc type: | Well | | |
| Monloc desc: | Not Reported | | |
| Huc code: | 18050004 | Drainagearea value: | Not Reported |
| Drainagearea Units: | Not Reported | Contrib drainagearea: | Not Reported |
| Contrib drainagearea units: | Not Reported | Latitude: | 37.6413208 |
| Longitude: | -121.8760679 | Sourcemap scale: | Not Reported |
| Horiz Acc measure: | Unknown | Horiz Acc measure units: | Unknown |
| Horiz Collection method: | Interpolated from map | | |
| Horiz coord refsys: | NAD83 | Vert measure val: | Not Reported |
| Vert measure units: | Not Reported | Vertacc measure val: | Not Reported |
| Vert accmeasure units: | Not Reported | | |
| Vertcollection method: | Not Reported | | |
| Vert coord refsys: | Not Reported | Countrycode: | US |
| Aquifername: | California Coastal Basin aquifers | | |
| Formation type: | Not Reported | | |

| | | | |
|---|---|---|---|
| Aquifer type: | Not Reported | | |
| Construction date: | Not Reported | Welldepth: | Not Reported |
| Welldepth units: | Not Reported | Wellholedepth: | Not Reported |
| Wellholedepth units: | Not Reported | | |

Ground-water levels, Number of Measurements: 0

| Map ID<br>Direction<br>Distance | Database | EDR ID Number |
|---|---|---|
| **1**<br>**ESE**<br>**1/2 - 1 Mile** | **OIL_GAS** | **CAOG9A000206814** |

| | | | |
|---|---|---|---|
| Districtnu: | 6 | Apinumber: | 00100021 |
| Blmwell: | N | Redrillcan: | Not Reported |
| Dryhole: | Y | Wellstatus: | P |
| Operatorna: | Chevron U.S.A. Inc. | | |
| Countyname: | Alameda | Fieldname: | Any Field |
| Areaname: | Any Area | | |
| Section: | 34 | | |
| Township: | 03S | Range: | 01E |
| Basemeridi: | MD | Elevation: | Not Reported |
| Locationde: | Not Reported | | |
| Glat: | 37.629942 | | |
| Glong: | -121.852087 | | |
| Gissourcec: | hud | | |
| Comments: | Status Code 006 | | |
| Leasename: | Foley | Wellnumber: | 1 |
| Epawell: | N | Hydraulica: | N |
| Confidenti: | N | Spuddate: | 30-DEC-99 |
| Welldeptha: | Not Reported | Redrillfoo: | Not Reported |
| Abandonedd: | / / | Completion: | / / |
| Gissymbol: | PDH | Site id: | CAOG9A000206814 |

# GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
# RADON

**AREA RADON INFORMATION**

State Database: CA Radon

Radon Test Results

| Zipcode | Num Tests | > 4 pCi/L |
|---|---|---|
| 94566 | 27 | 2 |

Federal EPA Radon Zone for ALAMEDA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

---

Federal Area Radon Information for Zip Code: 94566

Number of sites tested: 1

| Area | Average Activity | % <4 pCi/L | % 4-20 pCi/L | % >20 pCi/L |
|---|---|---|---|---|
| Living Area - 1st Floor | 1.700 pCi/L | 100% | 0% | 0% |
| Living Area - 2nd Floor | Not Reported | Not Reported | Not Reported | Not Reported |
| Basement | Not Reported | Not Reported | Not Reported | Not Reported |

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

## HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

## HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

## GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

## LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

## OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

# PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

**STREET AND ADDRESS INFORMATION**

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# APPENDIX B

## ENVIRONMENTAL DATA RESOURCES, INC.

### Sanborn Map Report

APPENDIX B

**Sportono Ranch**
1000 Minnie Street
Pleasanton, CA 94566

Inquiry Number: 4173137.3
January 05, 2015

# Certified Sanborn® Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

# Certified Sanborn® Map Report

1/05/15

| **Site Name:** | **Client Name:** |
|---|---|
| Sportono Ranch | Engeo Inc. |
| 1000 Minnie Street | 2010 Crow Canyon Place |
| Pleasanton, CA 94566 | San Ramon, CA 94583 |
| EDR Inquiry # 4173137.3 | Contact: Richard Gandolfo |

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Engeo Inc. were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

## *Certified Sanborn Results:*

| | |
|---|---|
| **Site Name:** | Sportono Ranch |
| **Address:** | 1000 Minnie Street |
| **City, State, Zip:** | Pleasanton, CA 94566 |
| **Cross Street:** | |
| **P.O. #** | P2014.001.862 |
| **Project:** | Spotorno Ranch |
| **Certification #** | 964E-4BB8-A13F |

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results
Certification # 964E-4BB8-A13F

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

*The Sanborn Library LLC Since 1866™*

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Engeo Inc. (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

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# APPENDIX C

## ENVIRONMENTAL DATA RESOURCES, INC.

## Historical Topographic Map Report

APPENDIX C

**Sportono Ranch**
1000 Minnie Street
Pleasanton, CA 94566

Inquiry Number: 4173137.4
January 05, 2015

# EDR Historical Topographic Map Report

6 Armstrong Road, 4th Floor
Shelton, Connecticut 06484
Toll Free: 800.352.0050
www.edrnet.com

# EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.


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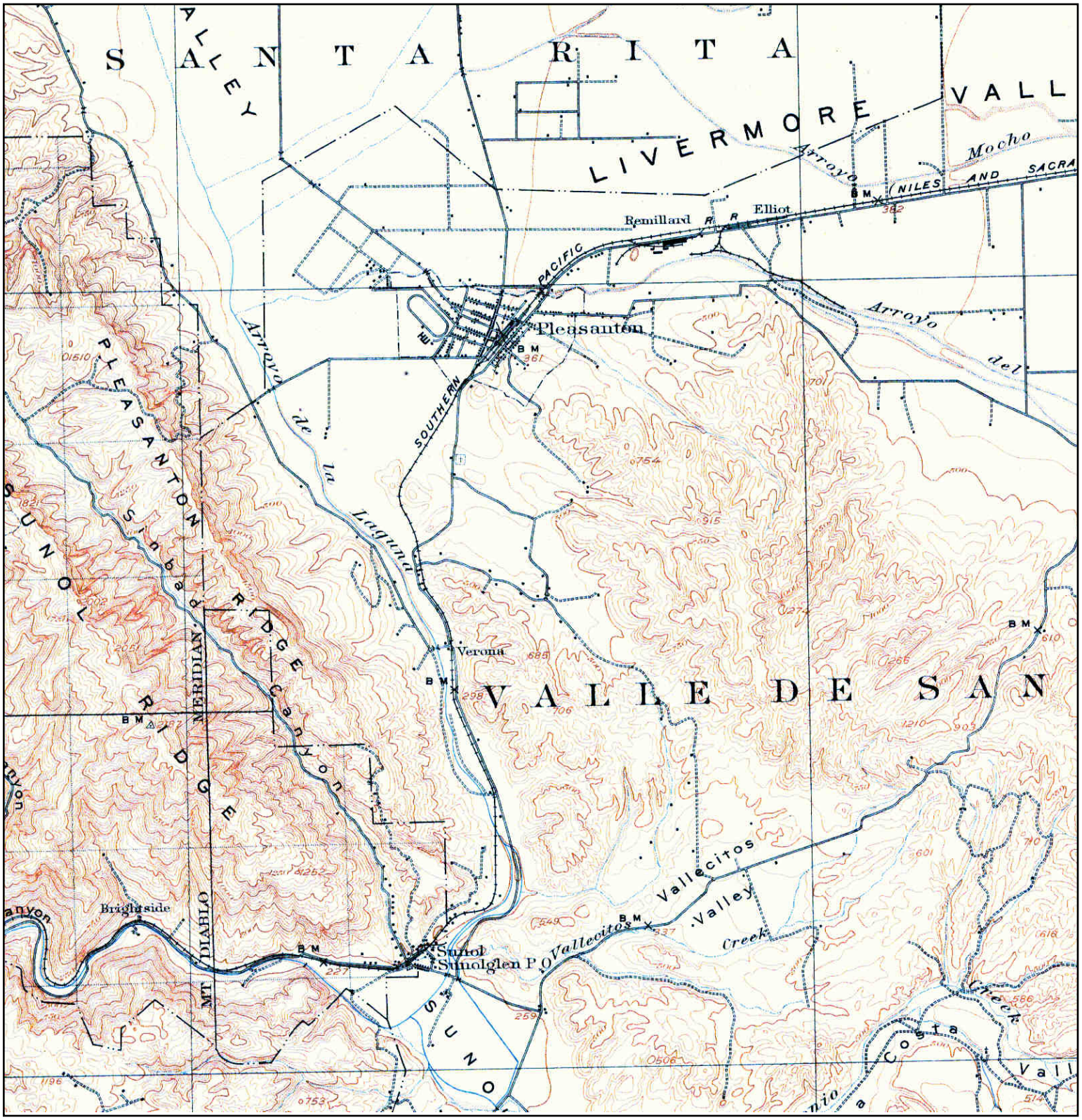
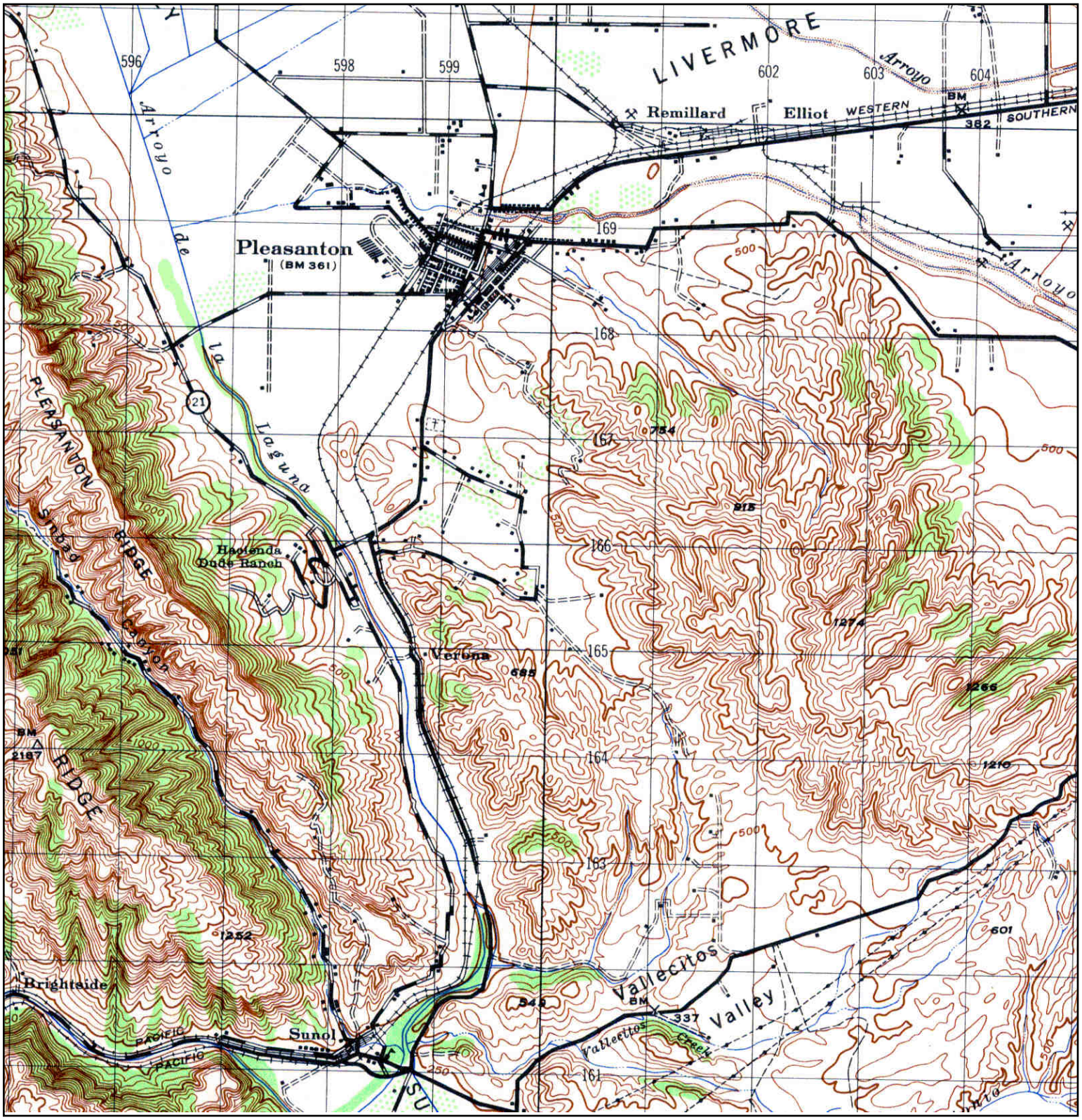
# Historical Topographic Map



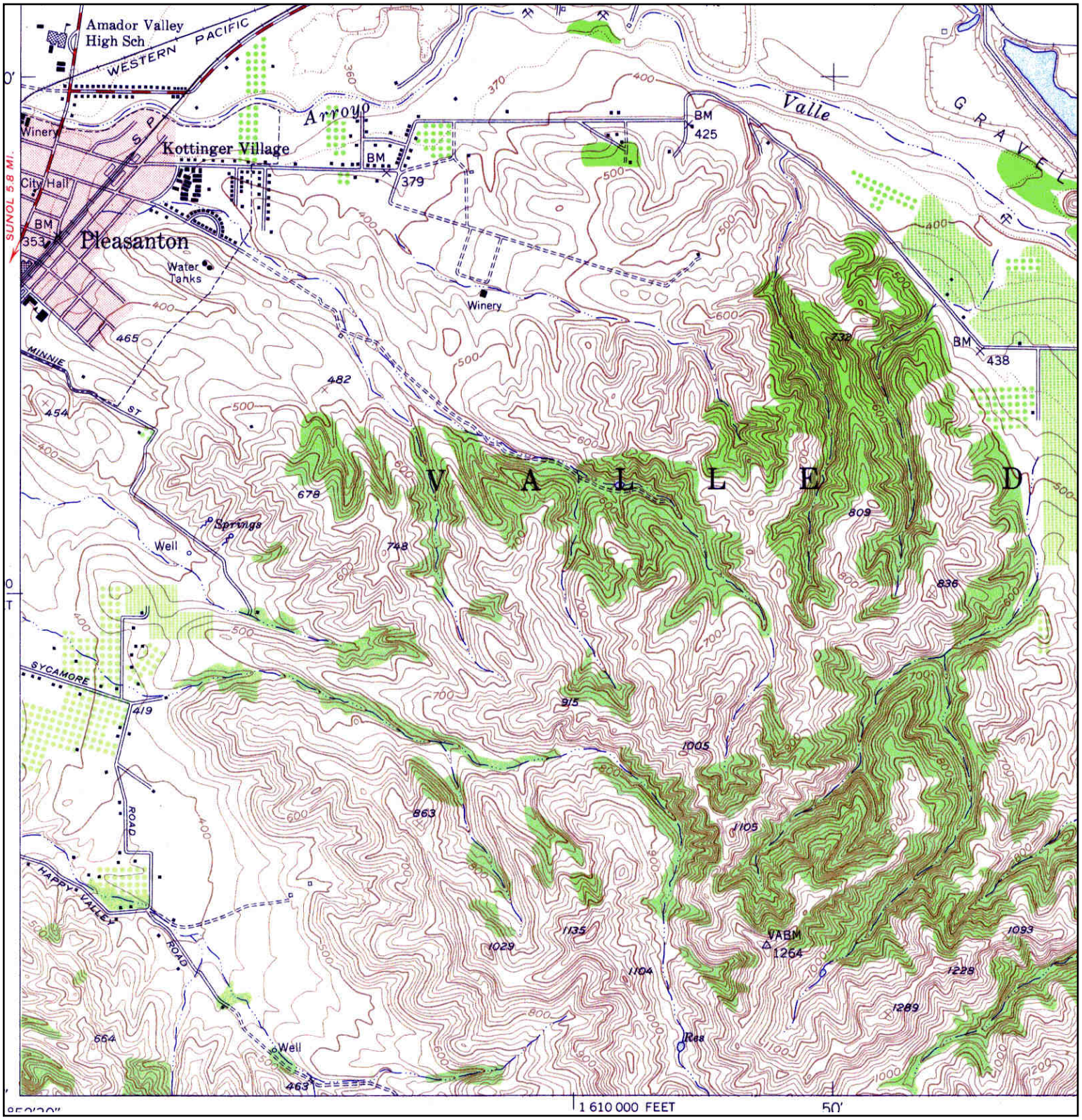

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: PLEASANTON<br>MAP YEAR: 1906<br><br>SERIES: 15<br>SCALE: 1:62500 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map



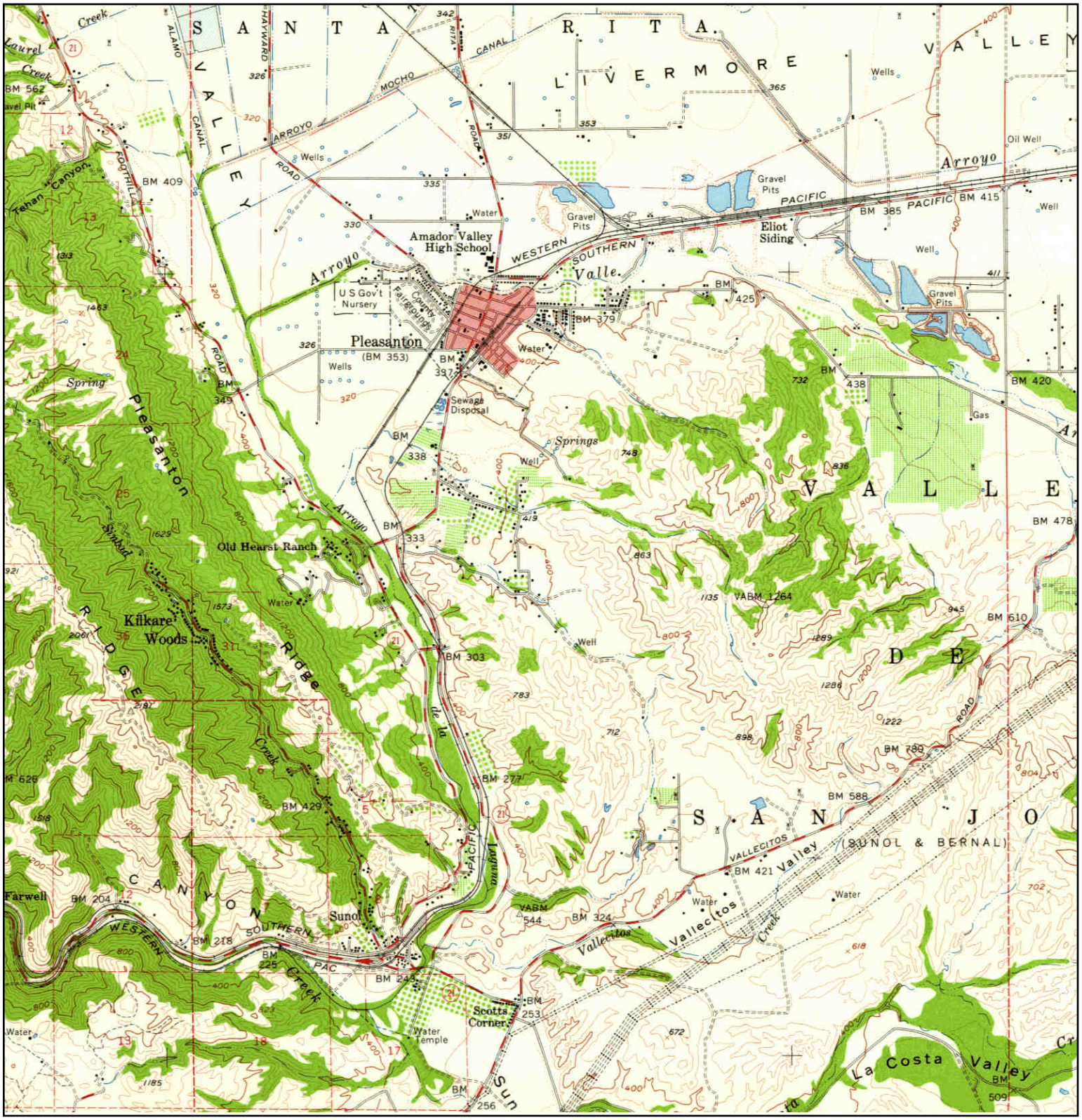

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: PLEASANTON<br>MAP YEAR: 1947<br><br>SERIES: 15<br>SCALE: 1:50000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map



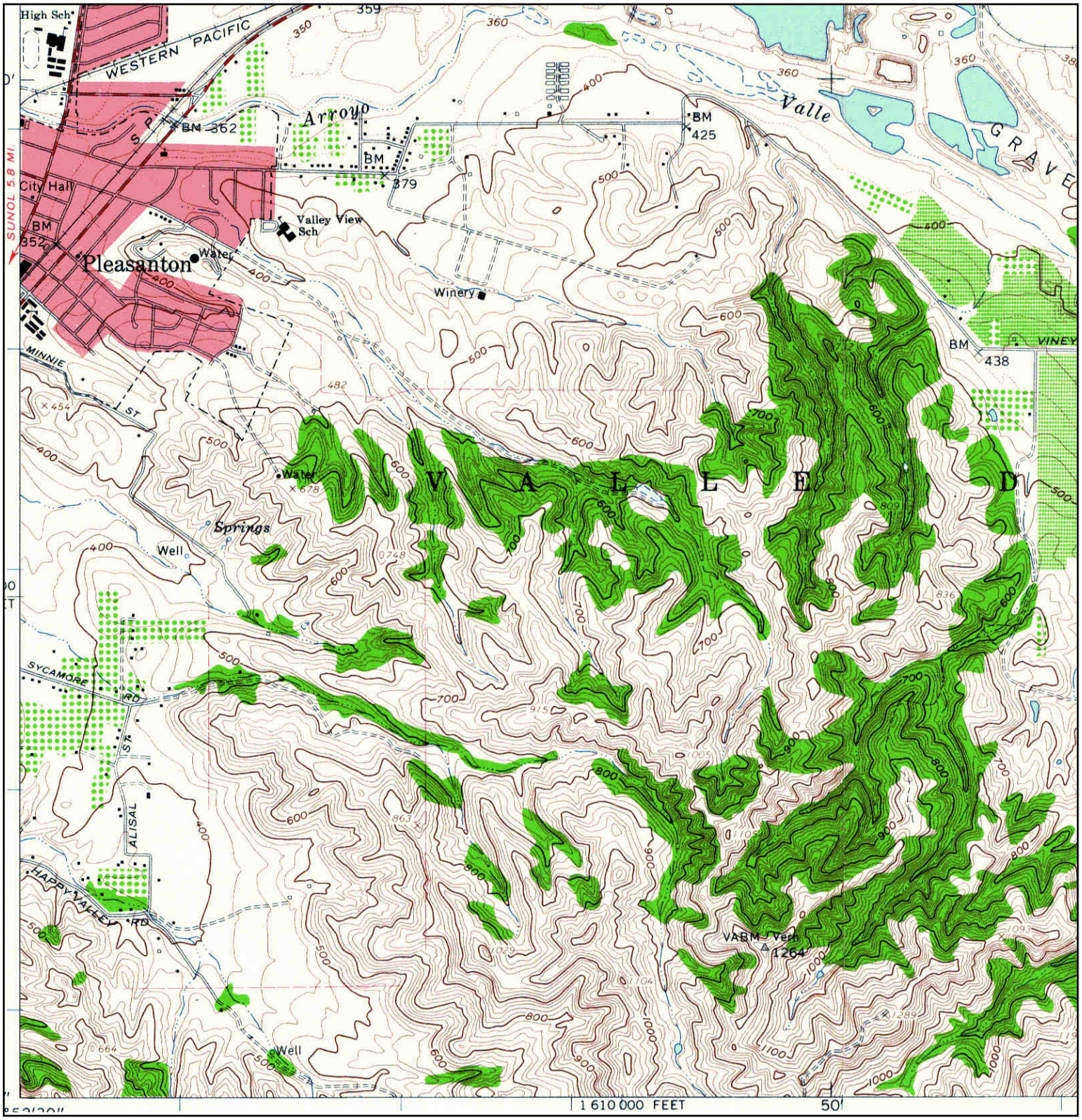

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1953<br><br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map



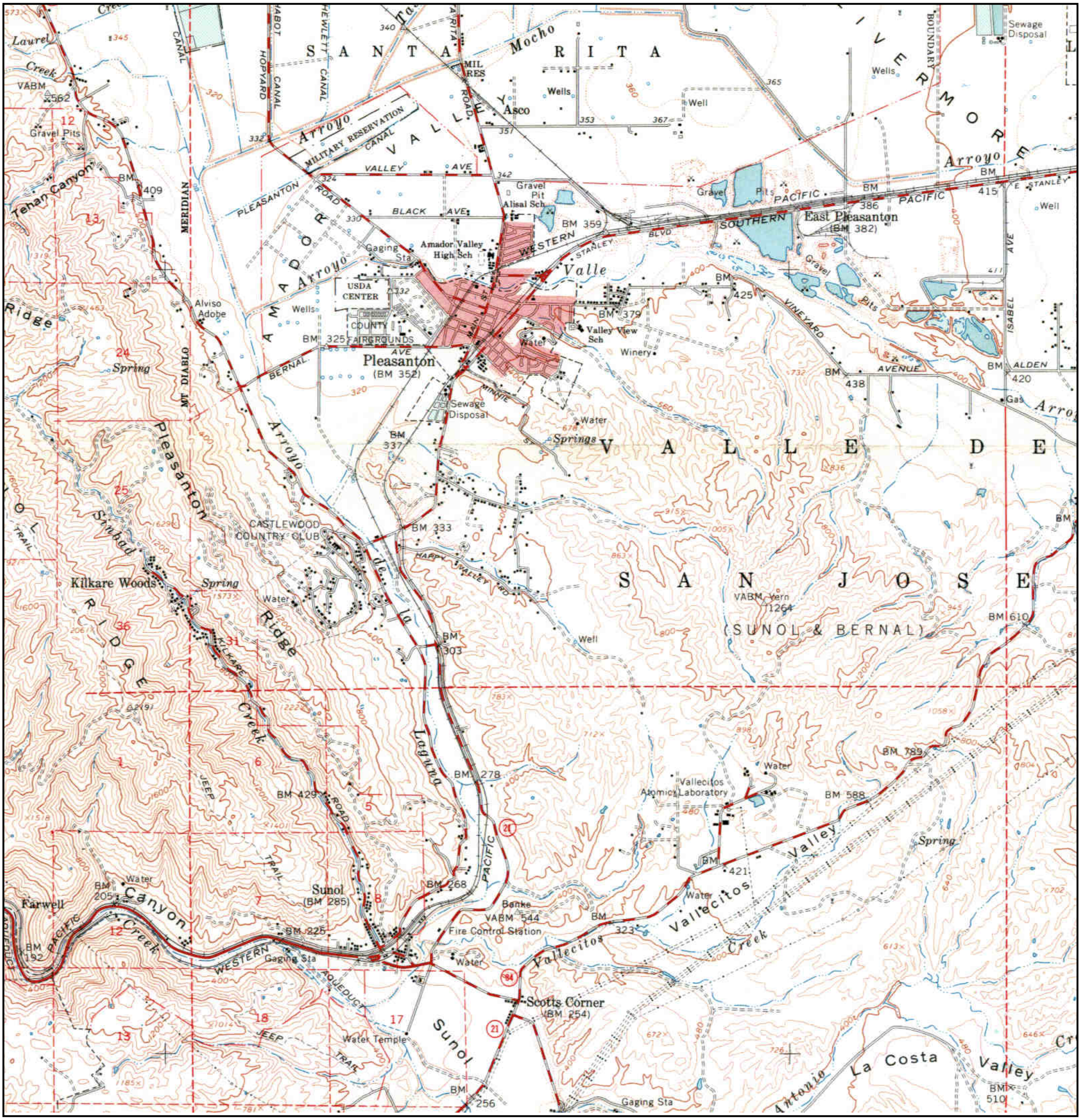

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1953<br><br>SERIES: 15<br>SCALE: 1:62500 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map



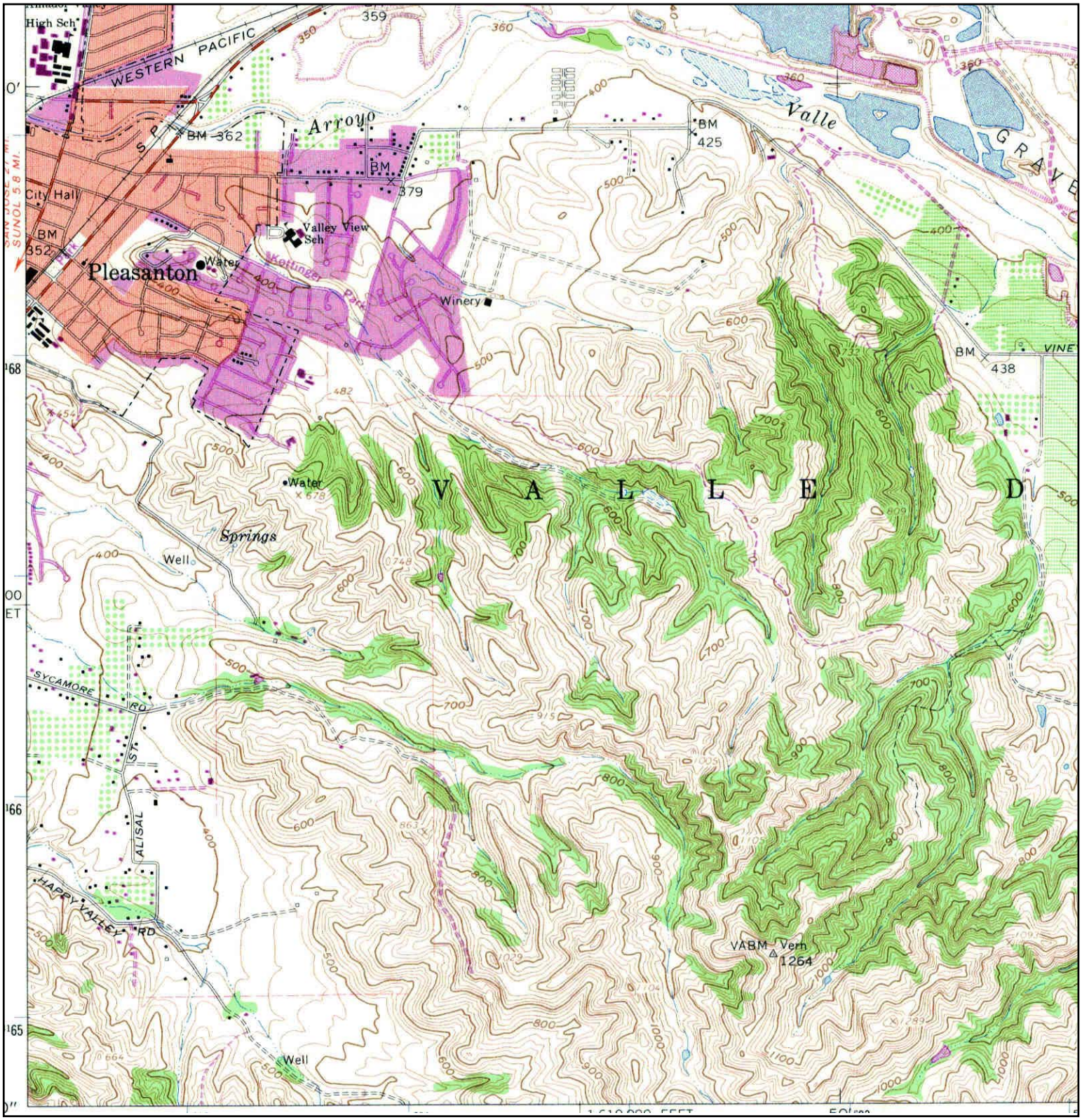

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1961<br><br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map



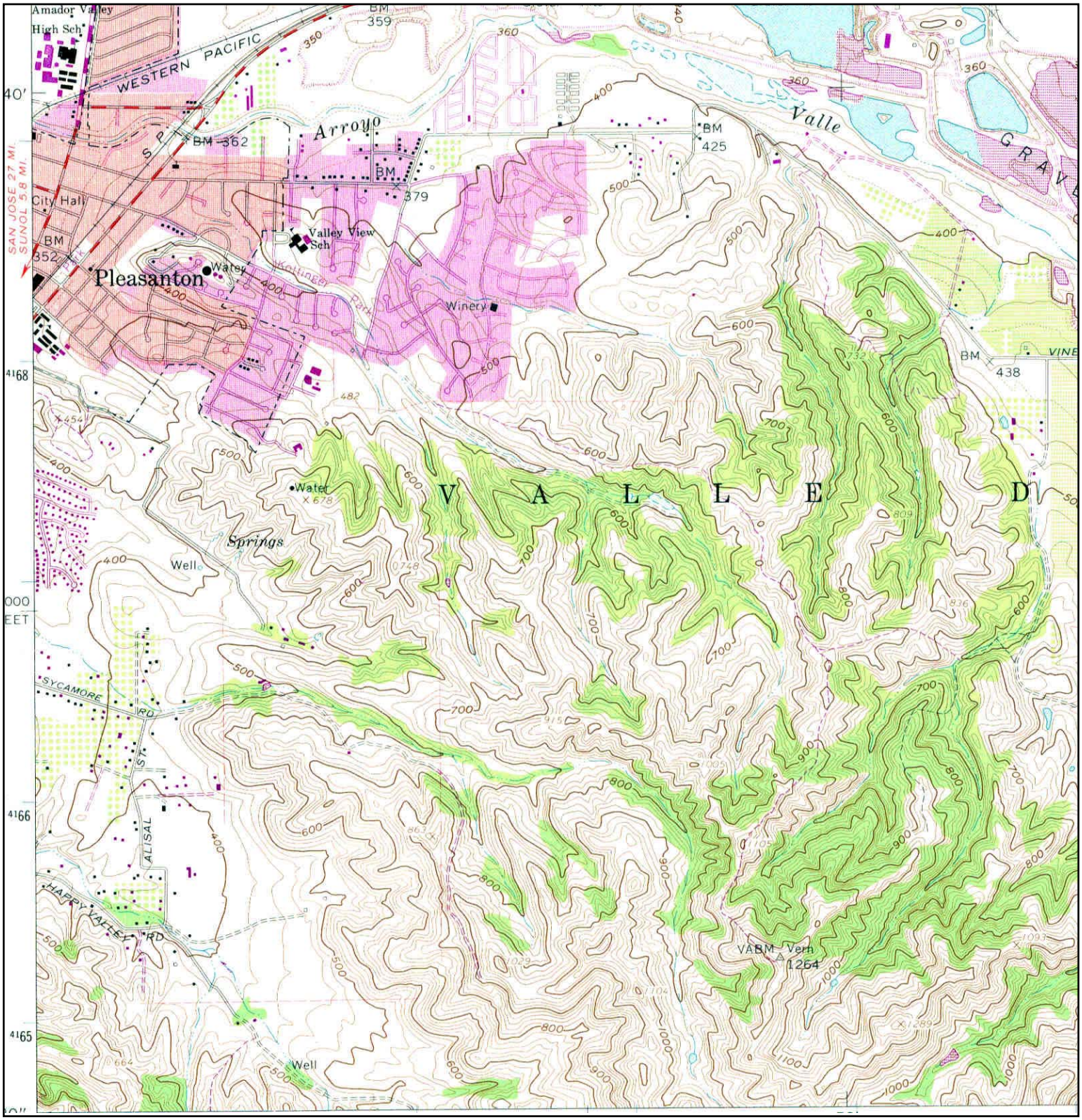

| | | | | | |
|---|---|---|---|---|---|
| N | TARGET QUAD NAME: LIVERMORE | SITE NAME: | Sportono Ranch | CLIENT: | Engeo Inc. |
| | MAP YEAR: 1961 | ADDRESS: | 1000 Minnie Street<br>Pleasanton, CA 94566 | CONTACT: | Richard Gandolfo |
| | SERIES: 15 | LAT/LONG: | 37.6359 / -121.8665 | INQUIRY#: | 4173137.4 |
| | SCALE: 1:62500 | | | RESEARCH DATE: | 01/05/2015 |

# Historical Topographic Map



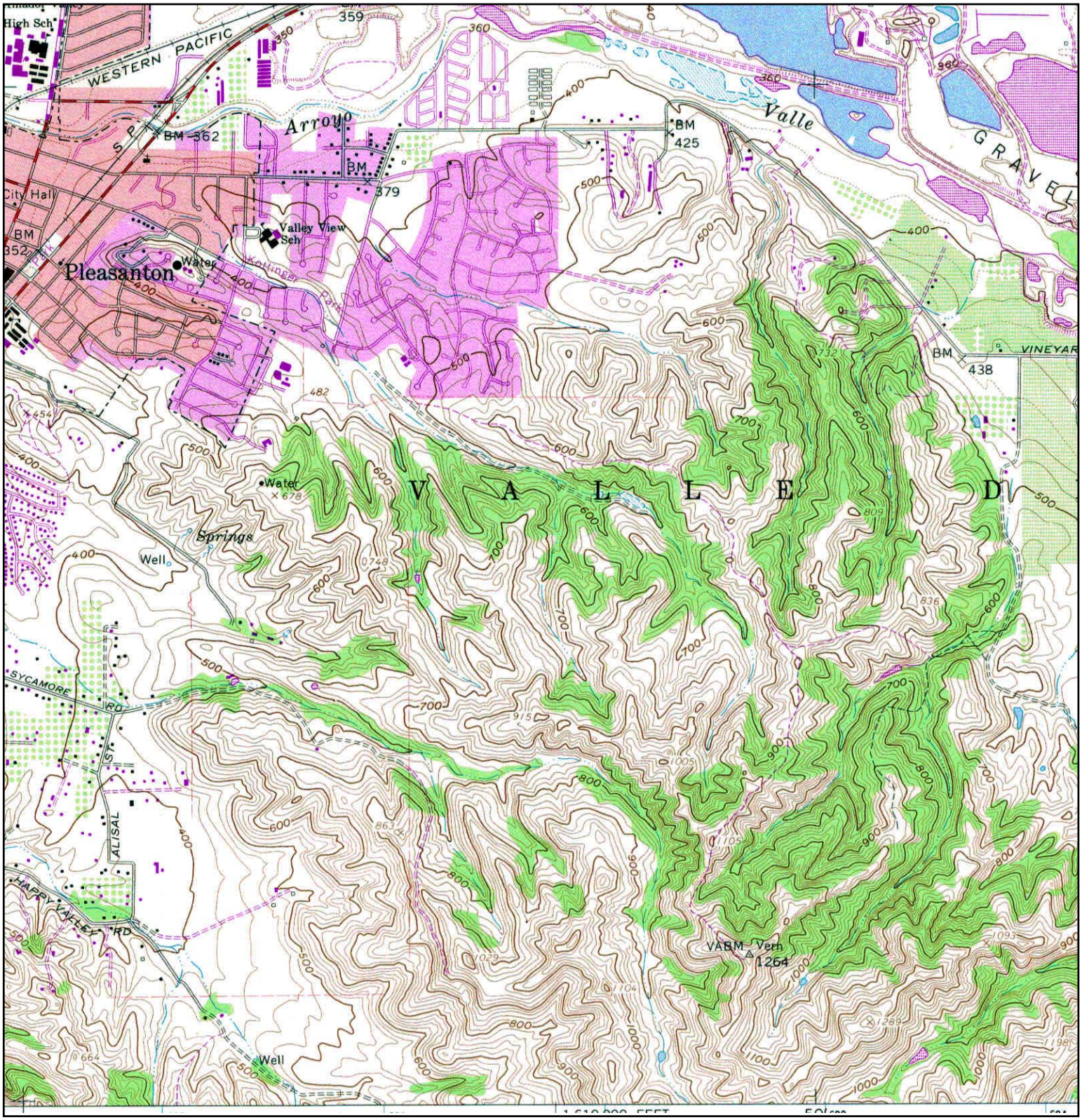

| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1968<br>PHOTOREVISED FROM :1961<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1973<br>PHOTOREVISED FROM :1961<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# Historical Topographic Map




| | | | |
|---|---|---|---|
| N | TARGET QUAD<br>NAME: LIVERMORE<br>MAP YEAR: 1980<br>PHOTOREVISED FROM :1961<br>SERIES: 7.5<br>SCALE: 1:24000 | SITE NAME: Sportono Ranch<br>ADDRESS: 1000 Minnie Street<br>Pleasanton, CA 94566<br>LAT/LONG: 37.6359 / -121.8665 | CLIENT: Engeo Inc.<br>CONTACT: Richard Gandolfo<br>INQUIRY#: 4173137.4<br>RESEARCH DATE: 01/05/2015 |

# APPENDIX D

## NORTH AMERICAN TITLE COMPANY

## Preliminary Title Report

APPENDIX D

First American Title

# First American Title Company

**6683 Owens Drive**
**Pleasanton, CA 94588**

| | |
|---|---|
| Escrow Officer: | Michelle Chan |
| Phone: | (925)738-4050 |
| Fax No.: | (866)648-7806 |
| E-Mail: | mlchan@firstam.com |
| Title Officer: | Sheryl Taylor |
| Phone: | (559)470-8819 |
| Fax No.: | |
| E-Mail: | ShTaylor@firstam.com |
| E-Mail Loan Documents to: | Lenders please contact the Escrow Officer for email address for sending loan documents. |
| Buyer: | TL Partners IV, L.P. |

## PRELIMINARY REPORT

In response to the above referenced application for a policy of title insurance, this company hereby reports that it is prepared to issue, or cause to be issued, as of the date hereof, a Policy or Policies of Title Insurance describing the land and the estate or interest therein hereinafter set forth, insuring against loss which may be sustained by reason of any defect, lien or encumbrance not shown or referred to as an Exception below or not excluded from coverage pursuant to the printed Schedules, Conditions and Stipulations of said Policy forms.

The printed Exceptions and Exclusions from the coverage and Limitations on Covered Risks of said policy or policies are set forth in Exhibit A attached. *The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than that set forth in the arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties.* Limitations on Covered Risks applicable to the CLTA and ALTA Homeowner's Policies of Title Insurance which establish a Deductible Amount and a Maximum Dollar Limit of Liability for certain coverages are also set forth in Exhibit A. Copies of the policy forms should be read. They are available from the office which issued this report.

**Please read the exceptions shown or referred to below and the exceptions and exclusions set forth in Exhibit A of this report carefully. The exceptions and exclusions are meant to provide you with notice of matters which are not covered under the terms of the title insurance policy and should be carefully considered.**

**It is important to note that this preliminary report is not a written representation as to the condition of title and may not list all liens, defects, and encumbrances affecting title to the land.**

This report (and any supplements or amendments hereto) is issued solely for the purpose of facilitating the issuance of a policy of title insurance and no liability is assumed hereby. If it is desired that liability be assumed prior to the issuance of a policy of title insurance, a Binder or Commitment should be requested.

Dated as of November 26, 2014 at 7:30 A.M.

The form of Policy of title insurance contemplated by this report is:

ALTA Extended Loan Policy - 2006

ALTA Extended Owner Policy - 2006

A specific request should be made if another form or additional coverage is desired.

Title to said estate or interest at the date hereof is vested in:

AVS RANCH, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY (SUCCESSOR BY MERGER TO THE ALEX V. SPOTORNO FAMILY LIVING LIMITED PARTNERSHIP, A CALIFORNIA LIMITED PARTNERSHIP) AND ALEX V. SPOTORNO, TRUSTEE OF THE ALEX V. SPOTORNO TRUST, UTD 12/11/86

The estate or interest in the land hereinafter described or referred to covered by this Report is:

A fee.

The Land referred to herein is described as follows:

(See attached Legal Description)

At the date hereof exceptions to coverage in addition to the printed Exceptions and Exclusions in said policy form would be as follows:

1. General and special taxes and assessments for the fiscal year 2014-2015.

| | |
|---|---|
| First Installment: | $1,752.03, PAID |
| Penalty: | $0.00 |
| Second Installment: | $1,752.03, OPEN |
| Penalty: | $0.00 |
| Tax Rate Area: | 19-115 |
| A. P. No.: | 949-0016-006 |

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. An easement shown or dedicated on the Map as referred to in the legal description
   For: public road, highway and incidental purposes.

   Affects: Lot 8

4. An easement for public highway and incidental purposes, recorded October 14, 1927 as Series No. X-78875, Book 1685, Page 397 of Official Records.
   In Favor of: County of Alameda
   Affects: Lot 8

5. Rights of the public in and to that portion of the land lying within any Road, Street, Alley or Highway.

6. Rights of parties in possession.

7. Any facts, rights, interests or claims which would be disclosed by a correct ALTA/ACSM survey.

**Prior to the issuance of any policy of title insurance, the Company will require:**

8. With respect to AVS Ranch, LLC, a California limited liability company:
   a. A copy of its operating agreement and any amendments thereto;
   b. If it is a California limited liability company, that a certified copy of its articles of organization (LLC-1) and any certificate of correction (LLC-11), certificate of amendment (LLC-2), or restatement of articles of organization (LLC-10) be recorded in the public records;
   c. If it is a foreign limited liability company, that a certified copy of its application for registration (LLC-5) be recorded in the public records;
   d. With respect to any deed, deed of trust, lease, subordination agreement or other document or instrument executed by such limited liability company and presented for recordation by the Company or upon which the Company is asked to rely, that such document or instrument be executed in accordance with one of the following, as appropriate:
   (i) If the limited liability company properly operates through officers appointed or elected pursuant to the terms of a written operating agreement, such document must be executed by at least two duly elected or appointed officers, as follows: the chairman of the board, the president or any vice president, and any secretary, assistant secretary, the chief financial officer or any assistant treasurer;
   (ii) If the limited liability company properly operates through a manager or managers identified in the articles of organization and/or duly elected pursuant to the terms of a written operating agreement, such document must be executed by at least two such managers or by one manager if the limited liability company properly operates with the existence of only one manager.
   e. Other requirements which the Company may impose following its review of the material required herein and other information which the Company may require

9. With respect to the trust referred to in the vesting:
   a. A certification pursuant to Section 18100.5 of the California Probate Code in a form satisfactory to the Company.
   b. Copies of those excerpts from the original trust documents and amendments thereto which designate the trustee and confer upon the trustee the power to act in the pending transaction.
   c. Other requirements which the Company may impose following its review of the material required herein and other information which the Company may require.

10. An ALTA/ACSM survey of recent date which complies with the current minimum standard detail requirements for ALTA/ACSM land title surveys.

## INFORMATIONAL NOTES

Note: The policy to be issued may contain an arbitration clause. When the Amount of Insurance is less than the certain dollar amount set forth in any applicable arbitration clause, all arbitrable matters shall be arbitrated at the option of either the Company or the Insured as the exclusive remedy of the parties. If you desire to review the terms of the policy, including any arbitration clause that may be included, contact the office that issued this Commitment or Report to obtain a sample of the policy jacket for the policy that is to be issued in connection with your transaction.

1. According to the latest available equalized assessment roll in the office of the county tax assessor, there is located on the land a(n) Single Family Residence known as 1000 Minnie Street, Pleasanton, California.

2. According to the public records, there has been no conveyance of the land within a period of twenty-four months prior to the date of this report, except as follows:

   None

3. We find no open deeds of trust. Escrow please confirm before closing.

The map attached, if any, may or may not be a survey of the land depicted hereon. First American expressly disclaims any liability for loss or damage which may result from reliance on this map except to the extent coverage for such loss or damage is expressly provided by the terms and provisions of the title insurance policy, if any, to which this map is attached.

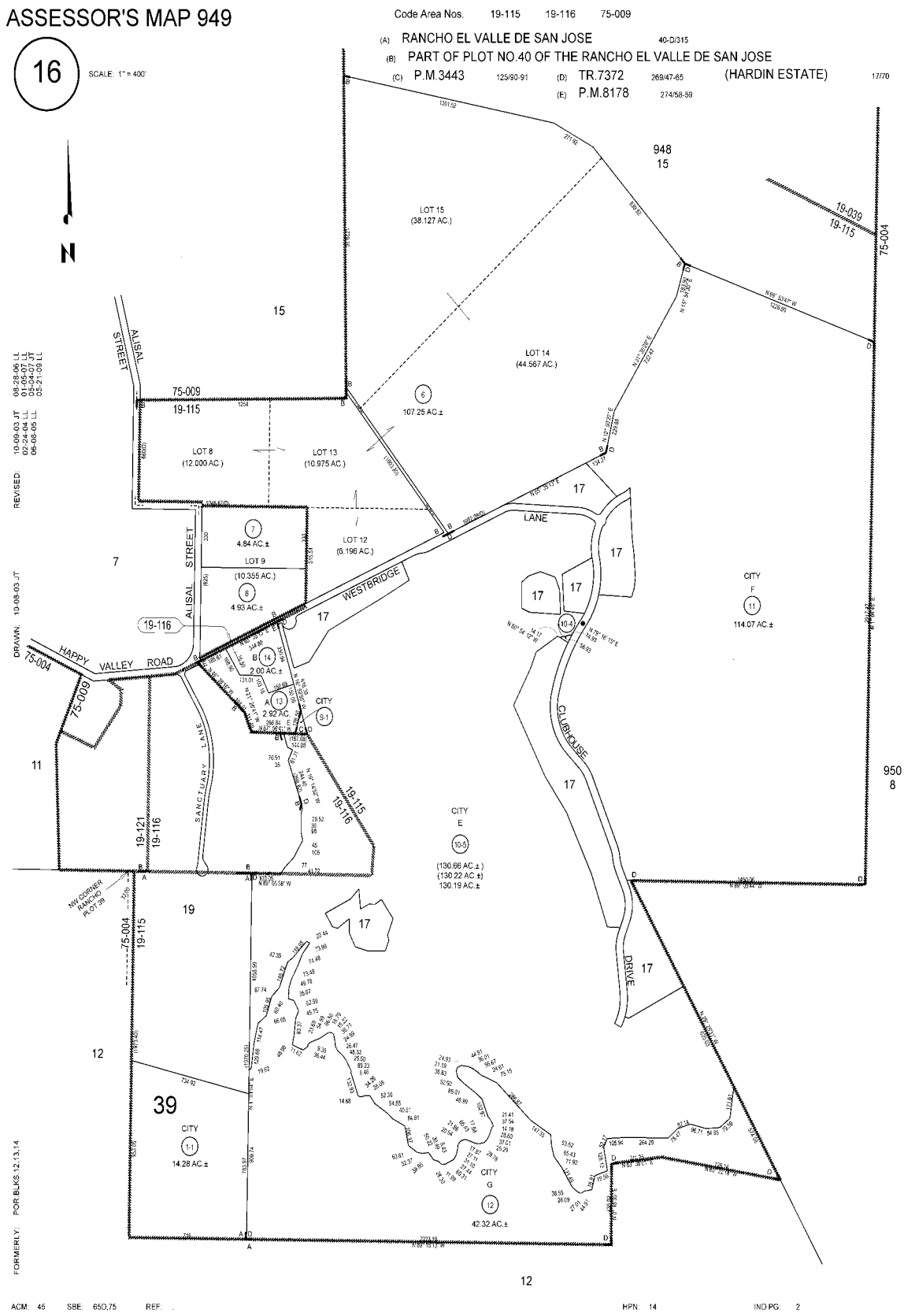
## LEGAL DESCRIPTION

Real property in the City of Pleasanton , County of Alameda, State of California, described as follows:

BEING LOTS 8, 12, 13, 14 AND 15 OF THE MAP ENTITLED "MAP SHOWING SURVEYS AND SUBDIVISIONS OF PART OF PLOT NO. 40 OF THE RANCHO DEL VALLE DE SAN JOSE" FILED IN BOOK 17 OF MAPS AT PAGE 70.

BEING PARCEL 3 AS DESCRIBED IN THAT CERTAIN LOT LINE ADJUSTMENT NUMBER PLA-105 AS DISCLOSED BY GRANT DEED RECORDED FEBRUARY 28, 2011 AS INSTRUMENT NO. 2011051050 OF OFFICIAL RECORDS.

APN: 949-0016-006


ASSESSOR'S MAP 949
16
SCALE: 1" = 400'
Code Area Nos. 19-115 19-116 75-009
(A) RANCHO EL VALLE DE SAN JOSE 40-D/315
(B) PART OF PLOT NO.40 OF THE RANCHO EL VALLE DE SAN JOSE
(C) P.M.3443 125/90-91
(D) TR.7372 269/47-65
(E) P.M.8178 274/58-59
(HARDIN ESTATE)
17770
N
948
15
LOT 15
(38.127 AC.)
LOT 14
(44.567 AC.)
107.25 AC.±
19-039
19-115
75-004
15
ALISAL STREET
75-009
19-115
LOT 8
(12.000 AC.)
LOT 13
(10.975 AC.)
LOT 12
(6.196 AC.)
4.84 AC.±
LOT 9
(10.355 AC.)
4.93 AC.±
2.00 AC.±
2.92 AC.±
17
LANE
WESTERBRIDGE
CITY
F
114.07 AC.±
7
19-116
HAPPY VALLEY ROAD
75-004
75-009
11
SANCTUARY LANE
19-121
19-116
19-115
CITY
E
(130.66 AC.±)
(130.22 AC.±)
130.19 AC.±
CLUBHOUSE
DRIVE
950
8
NW CORNER RANCHO PLOT 39
19
12
39
CITY
14.28 AC.±
CITY
G
42.32 AC.±
12
REVISED: 10-09-03 JT 08-29-06 LL 02-24-04 LL 01-04-07 JT 06-08-05 LL 05-21-09 LL
DRAWN: 10-08-03 JT
FORMERLY: POR.BLKS.12,13,14
ACM: 45 SBE: 65D,75 REF: HPN: 14 IND.PG: 2

## ***NOTICE***

Section 12413.1 of the California Insurance Code, effective January 1, 1990, requires that any title insurance company, underwritten title company, or controlled escrow company handling funds in an escrow or sub-escrow capacity, wait a specified number of days after depositing funds, before recording any documents in connection with the transaction or disbursing funds. This statute allows for funds deposited by wire transfer to be disbursed the same day as deposit. In the case of cashier's checks or certified checks, funds may be disbursed the next day after deposit. In order to avoid unnecessary delays of three to seven days, or more, please use wire transfer, cashier's checks, or certified checks whenever possible.

**EXHIBIT A**
**LIST OF PRINTED EXCEPTIONS AND EXCLUSIONS (BY POLICY TYPE)**

**CLTA/ALTA HOMEOWNER'S POLICY OF TITLE INSURANCE (02-03-10)**
**EXCLUSIONS**

In addition to the Exceptions in Schedule B, You are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of those portions of any law or government regulation concerning:
   (a) building; (d) improvements on the Land;
   (b) zoning; (e) land division; and
   (c) land use; (f) environmental protection.

   This Exclusion does not limit the coverage described in Covered Risk 8.a., 14, 15, 16, 18, 19, 20, 23 or 27.
2. The failure of Your existing structures, or any part of them, to be constructed in accordance with applicable building codes. This Exclusion does not limit the coverage described in Covered Risk 14 or 15.
3. The right to take the Land by condemning it. This Exclusion does not limit the coverage described in Covered Risk 17.
4. Risks:
   (a) that are created, allowed, or agreed to by You, whether or not they are recorded in the Public Records;
   (b) that are Known to You at the Policy Date, but not to Us, unless they are recorded in the Public Records at the Policy Date;
   (c) that result in no loss to You; or
   (d) that first occur after the Policy Date - this does not limit the coverage described in Covered Risk 7, 8.e., 25, 26, 27 or 28.
5. Failure to pay value for Your Title.
6. Lack of a right:
   (a) to any land outside the area specifically described and referred to in paragraph 3 of Schedule A; and
   (b) in streets, alleys, or waterways that touch the Land.
   This Exclusion does not limit the coverage described in Covered Risk 11 or 21.
7. The transfer of the Title to You is invalid as a preferential transfer or as a fraudulent transfer or conveyance under federal bankruptcy, state insolvency, or similar creditors' rights laws.

**LIMITATIONS ON COVERED RISKS**

Your insurance for the following Covered Risks is limited on the Owner's Coverage Statement as follows: For Covered Risk 16, 18, 19, and 21 Your Deductible Amount and Our Maximum Dollar Limit of Liability shown in Schedule A.

| Your Deductible Amount | Our Maximum Dollar Limit of Liability |
|---|---|
| Covered Risk 16: 1% of Policy Amount or $2,500.00 (whichever is less) | $10,000.00 |
| Covered Risk 18: 1% of Policy Amount or $5,000.00 (whichever is less) | $25,000.00 |
| Covered Risk 19: 1% of Policy Amount or $5,000.00 (whichever is less) | $25,000.00 |
| Covered Risk 21: 1% of Policy Amount or $2,500.00 (whichever is less) | $5,000.00 |

**ALTA RESIDENTIAL TITLE INSURANCE POLICY (6-1-87)**
**EXCLUSIONS**

In addition to the Exceptions in Schedule B, you are not insured against loss, costs, attorneys' fees, and expenses resulting from:

1. Governmental police power, and the existence or violation of any law or government regulation. This includes building and zoning ordinances and also laws and regulations concerning:
   (a) and use
   (b) improvements on the land
   (c) and division
   (d) environmental protection

   This exclusion does not apply to violations or the enforcement of these matters which appear in the public records at Policy Date.
   This exclusion does not limit the zoning coverage described in Items 12 and 13 of Covered Title Risks.
2. The right to take the land by condemning it, unless:

(a) a notice of exercising the right appears in the public records on the Policy Date

(b) the taking happened prior to the Policy Date and is binding on you if you bought the land without knowing of the taking

3. Title Risks:

(a) that are created, allowed, or agreed to by you

(b) that are known to you, but not to us, on the Policy Date -- unless they appeared in the public records

(c) that result in no loss to you

(d) that first affect your title after the Policy Date -- this does not limit the labor and material lien coverage in Item 8 of Covered Title Risks

4. Failure to pay value for your title.
5. Lack of a right:

(a) to any land outside the area specifically described and referred to in Item 3 of Schedule A OR

(b) in streets, alleys, or waterways that touch your land

This exclusion does not limit the access coverage in Item 5 of Covered Title Risks.

**2006 ALTA LOAN POLICY (06-17-06)**

**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

(i) the occupancy, use, or enjoyment of the Land;

(ii) the character, dimensions, or location of any improvement erected on the Land;

(iii) the subdivision of land; or

(iv) environmental protection;

or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.

(b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.

2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters

(a) created, suffered, assumed, or agreed to by the Insured Claimant;

(b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;

(c) resulting in no loss or damage to the Insured Claimant;

(d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 13, or 14); or

(e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.

4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law.
6. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is

(a) a fraudulent conveyance or fraudulent transfer, or

(b) a preferential transfer for any reason not stated in Covered Risk 13(b) of this policy.

7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the Insured Mortgage in the Public Records. This Exclusion does not modify or limit the coverage provided under Covered Risk 11(b).

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

**EXCEPTIONS FROM COVERAGE**

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) that arise by reason of:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an

inspection of the Land or that may be asserted by persons in possession of the Land.

3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the public records.

**2006 ALTA OWNER'S POLICY (06-17-06)**

**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

   (i) the occupancy, use, or enjoyment of the Land;

   (ii) the character, dimensions, or location of any improvement erected on the Land;

   (iii) the subdivision of land; or

   (iv) environmental protection;

   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5.

   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 6.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters

   (a) created, suffered, assumed, or agreed to by the Insured Claimant;

   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;

   (c) resulting in no loss or damage to the Insured Claimant;

   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 9 or 10); or

   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Title.
4. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction vesting the Title as shown in Schedule A, is

   (a) a fraudulent conveyance or fraudulent transfer, or

   (b) a preferential transfer for any reason not stated in Covered Risk 9 of this policy.
5. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching between Date of Policy and the date of recording of the deed or other instrument of transfer in the Public Records that vests Title as shown in Schedule A.

The above policy form may be issued to afford either Standard Coverage or Extended Coverage. In addition to the above Exclusions from Coverage, the Exceptions from Coverage in a Standard Coverage policy will also include the following Exceptions from Coverage:

**EXCEPTIONS FROM COVERAGE**

This policy does not insure against loss or damage (and the Company will not pay costs, attorneys' fees or expenses) that arise by reason of:

1. (a) Taxes or assessments that are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records; (b) proceedings by a public agency that may result in taxes or assessments, or notices of such proceedings, whether or not shown by the records of such agency or by the Public Records.
2. Any facts, rights, interests, or claims that are not shown by the Public Records but that could be ascertained by an inspection of the Land or that may be asserted by persons in possession of the Land.
3. Easements, liens or encumbrances, or claims thereof, not shown by the Public Records.
4. Any encroachment, encumbrance, violation, variation, or adverse circumstance affecting the Title that would be disclosed by an accurate and complete land survey of the Land and not shown by the Public Records.
5. (a) Unpatented mining claims; (b) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (c) water rights, claims or title to water, whether or not the matters excepted under (a), (b), or (c) are shown by the Public Records.
6. Any lien or right to a lien for services, labor or material not shown by the public records.

**ALTA EXPANDED COVERAGE RESIDENTIAL LOAN POLICY (07-26-10)**

**EXCLUSIONS FROM COVERAGE**

The following matters are expressly excluded from the coverage of this policy, and the Company will not pay loss or damage, costs, attorneys' fees, or expenses that arise by reason of:

1. (a) Any law, ordinance, permit, or governmental regulation (including those relating to building and zoning) restricting, regulating, prohibiting, or relating to

   (i) the occupancy, use, or enjoyment of the Land;

   (ii) the character, dimensions, or location of any improvement erected on the Land;

   (iii) the subdivision of land; or

   (iv) environmental protection;

   or the effect of any violation of these laws, ordinances, or governmental regulations. This Exclusion 1(a) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.

   (b) Any governmental police power. This Exclusion 1(b) does not modify or limit the coverage provided under Covered Risk 5, 6, 13(c), 13(d), 14 or 16.
2. Rights of eminent domain. This Exclusion does not modify or limit the coverage provided under Covered Risk 7 or 8.
3. Defects, liens, encumbrances, adverse claims, or other matters

   (a) created, suffered, assumed, or agreed to by the Insured Claimant;

   (b) not Known to the Company, not recorded in the Public Records at Date of Policy, but Known to the Insured Claimant and not disclosed in writing to the Company by the Insured Claimant prior to the date the Insured Claimant became an Insured under this policy;

   (c) resulting in no loss or damage to the Insured Claimant;

   (d) attaching or created subsequent to Date of Policy (however, this does not modify or limit the coverage provided under Covered Risk 11, 16, 17, 18, 19, 20, 21, 22, 23, 24, 27 or 28); or

   (e) resulting in loss or damage that would not have been sustained if the Insured Claimant had paid value for the Insured Mortgage.
4. Unenforceability of the lien of the Insured Mortgage because of the inability or failure of an Insured to comply with applicable doing-business laws of the state where the Land is situated.
5. Invalidity or unenforceability in whole or in part of the lien of the Insured Mortgage that arises out of the transaction evidenced by the Insured Mortgage and is based upon usury or any consumer credit protection or truth-in-lending law. This Exclusion does not modify or limit the coverage provided in Covered Risk 26.
6. Any claim of invalidity, unenforceability or lack of priority of the lien of the Insured Mortgage as to Advances or modifications made after the Insured has Knowledge that the vestee shown in Schedule A is no longer the owner of the estate or interest covered by this policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11.
7. Any lien on the Title for real estate taxes or assessments imposed by governmental authority and created or attaching subsequent to Date of Policy. This Exclusion does not modify or limit the coverage provided in Covered Risk 11(b) or 25.
8. The failure of the residential structure, or any portion of it, to have been constructed before, on or after Date of Policy in accordance with applicable building codes. This Exclusion does not modify or limit the coverage provided in Covered Risk 5 or 6.
9. Any claim, by reason of the operation of federal bankruptcy, state insolvency, or similar creditors' rights laws, that the transaction creating the lien of the Insured Mortgage, is

   (a) a fraudulent conveyance or fraudulent transfer, or

   (b) a preferential transfer for any reason not stated in Covered Risk 27(b) of this policy.

First American Title

**Privacy Information**
**We Are Committed to Safeguarding Customer Information**
In order to better serve your needs now and in the future, we may ask you to provide us with certain information. We understand that you may be concerned about what we will do with such information - particularly any personal or financial information. We agree that you have a right to know how we will utilize the personal information you provide to us. Therefore, together with our subsidiaries we have adopted this Privacy Policy to govern the use and handling of your personal information.

**Applicability**
This Privacy Policy governs our use of the information that you provide to us. It does not govern the manner in which we may use information we have obtained from any other source, such as information obtained from a public record or from another person or entity. First American has also adopted broader guidelines that govern our use of personal information regardless of its source. First American calls these guidelines its Fair Information Values.

**Types of Information**
Depending upon which of our services you are utilizing, the types of nonpublic personal information that we may collect include:

- Information we receive from you on applications, forms and in other communications to us, whether in writing, in person, by telephone or any other means;
- Information about your transactions with us, our affiliated companies, or others; and
- Information we receive from a consumer reporting agency.

**Use of Information**
We request information from you for our own legitimate business purposes and not for the benefit of any nonaffiliated party. Therefore, we will not release your information to nonaffiliated parties except: (1) as necessary for us to provide the product or service you have requested of us; or (2) as permitted by law. We may, however, store such information indefinitely, including the period after which any customer relationship has ceased. Such information may be used for any internal purpose, such as quality control efforts or customer analysis. We may also provide all of the types of nonpublic personal information listed above to one or more of our affiliated companies. Such affiliated companies include financial service providers, such as title insurers, property and casualty insurers, and trust and investment advisory companies, or companies involved in real estate services, such as appraisal companies, home warranty companies and escrow companies. Furthermore, we may also provide all the information we collect, as described above, to companies that perform marketing services on our behalf, on behalf of our affiliated companies or to other financial institutions with whom we or our affiliated companies have joint marketing agreements.

**Former Customers**
Even if you are no longer our customer, our Privacy Policy will continue to apply to you.

**Confidentiality and Security**
We will use our best efforts to ensure that no unauthorized parties have access to any of your information. We restrict access to nonpublic personal information about you to those individuals and entities who need to know that information to provide products or services to you. We will use our best efforts to train and oversee our employees and agents to ensure that your information will be handled responsibly and in accordance with this Privacy Policy and First American's Fair Information Values. We currently maintain physical, electronic, and procedural safeguards that comply with federal regulations to guard your nonpublic personal information.

**Information Obtained Through Our Web Site**
First American Financial Corporation is sensitive to privacy issues on the Internet. We believe it is important you know how we treat the information about you we receive on the Internet.
In general, you can visit First American or its affiliates' Web sites on the World Wide Web without telling us who you are or revealing any information about yourself. Our Web servers collect the domain names, not the e-mail addresses, of visitors. This information is aggregated to measure the number of visits, average time spent on the site, pages viewed and similar information. First American uses this information to measure the use of our site and to develop ideas to improve the content of our site.
There are times, however, when we may need information from you, such as your name and email address. When information is needed, we will use our best efforts to let you know at the time of collection how we will use the personal information. Usually, the personal information we collect is used only by us to respond to your inquiry, process an order or allow you to access specific account/profile information. If you choose to share any personal information with us, we will only use it in accordance with the policies outlined above.

**Business Relationships**
First American Financial Corporation's site and its affiliates' sites may contain links to other Web sites. While we try to link only to sites that share our high standards and respect for privacy, we are not responsible for the content or the privacy practices employed by other sites.

**Cookies**
Some of First American's Web sites may make use of "cookie" technology to measure site activity and to customize information to your personal tastes. A cookie is an element of data that a Web site can send to your browser, which may then store the cookie on your hard drive.
FirstAm.com uses stored cookies. The goal of this technology is to better serve you when visiting our site, save you time when you are here and to provide you with a more meaningful and productive Web site experience.
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**Fair Information Values**
**Fairness** We consider consumer expectations about their privacy in all our businesses. We only offer products and services that assure a favorable balance between consumer benefits and consumer privacy.
**Public Record** We believe that an open public record creates significant value for society, enhances consumer choice and creates consumer opportunity. We actively support an open public record and emphasize its importance and contribution to our economy.
**Use** We believe we should behave responsibly when we use information about a consumer in our business. We will obey the laws governing the collection, use and dissemination of data.
**Accuracy** We will take reasonable steps to help assure the accuracy of the data we collect, use and disseminate. Where possible, we will take reasonable steps to correct inaccurate information. When, as with the public record, we cannot correct inaccurate information, we will take all reasonable steps to assist consumers in identifying the source of the erroneous data so that the consumer can secure the required corrections.
**Education** We endeavor to educate the users of our products and services, our employees and others in our industry about the importance of consumer privacy. We will instruct our employees on our fair information values and on the responsible collection and use of data. We will encourage others in our industry to collect and use information in a responsible manner.
**Security** We will maintain appropriate facilities and systems to protect against unauthorized access to and corruption of the data we maintain.

# APPENDIX E

## ENVIRONMENTAL DATA RESOURCES, INC.

### Aerial Photo Decade Package

APPENDIX E

# APPENDIX F

## ENVIRONMENTAL DATA RESOURCES, INC.

### City Directory

APPENDIX F

**Sportono Ranch**
1000 Minnie Street
Pleasanton, CA 94566

Inquiry Number: 4173137.5
January 05, 2015

# The EDR-City Directory Image Report

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

# TABLE OF CONTENTS

## SECTION

**Executive Summary**

**Findings**

**City Directory Images**

***Thank you for your business.***
Please contact EDR at 1-800-352-0050
with any questions or comments.

**Disclaimer - Copyright and Trademark Notice**

This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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# EXECUTIVE SUMMARY

## DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Report includes a search of available city directory data at 5 year intervals.

## RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

| *Year* | *Target Street* | *Cross Street* | *Source* |
|---|---|---|---|
| 2013 | ☑ | ☑ | Cole Information Services |
| 2008 | ☑ | ☑ | Cole Information Services |
| 2003 | ☐ | ☑ | Cole Information Services |
| 1999 | ☑ | ☑ | Cole Information Services |
| 1995 | ☐ | ☑ | Cole Information Services |
| 1992 | ☐ | ☑ | Cole Information Services |
| 1989 | ☐ | ☑ | Haines Criss-Cross Directory |
| 1985 | ☐ | ☑ | Haines Criss-Cross Directory |
| 1980 | ☐ | ☑ | Haines Criss-Cross Directory |
| 1975 | ☐ | ☑ | Haines Criss-Cross Directory |

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# FINDINGS

## TARGET PROPERTY STREET

1000 Minnie Street
Pleasanton, CA 94566

| ***Year*** | ***CD Image*** | ***Source*** | |
|---|---|---|---|
| **MINNIE ST** | | | |
| 2013 | pg A1 | Cole Information Services | |
| 2008 | pg A3 | Cole Information Services | |
| 2003 | - | Cole Information Services | Target and Adjoining not listed in Source |
| 1999 | pg A6 | Cole Information Services | |
| 1995 | - | Cole Information Services | Target and Adjoining not listed in Source |
| 1992 | - | Cole Information Services | Target and Adjoining not listed in Source |
| 1989 | - | Haines Criss-Cross Directory | Street not listed in Source |
| 1985 | - | Haines Criss-Cross Directory | Street not listed in Source |
| 1980 | - | Haines Criss-Cross Directory | Street not listed in Source |
| 1975 | - | Haines Criss-Cross Directory | Street not listed in Source |

# FINDINGS

## CROSS STREETS

| *Year* | *CD Image* | *Source* |
|---|---|---|

## ALISAL ST

| | | |
|---|---|---|
| 2013 | pg. A2 | Cole Information Services |
| 2008 | pg. A4 | Cole Information Services |
| 2003 | pg. A5 | Cole Information Services |
| 1999 | pg. A7 | Cole Information Services |
| 1995 | pg. A8 | Cole Information Services |
| 1992 | pg. A9 | Cole Information Services |
| 1989 | pg. A10 | Haines Criss-Cross Directory |
| 1985 | pg. A11 | Haines Criss-Cross Directory |
| 1980 | pg. A12 | Haines Criss-Cross Directory |
| 1980 | pg. A13 | Haines Criss-Cross Directory |
| 1975 | pg. A14 | Haines Criss-Cross Directory |
| 1975 | pg. A15 | Haines Criss-Cross Directory |

# City Directory Images

| Target Street | Cross Street | Source |
| --- | --- | --- |
| ✓ | - | Cole Information Services |

# MINNIE ST 2013

1000 ALEX SPOTORNO

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 2013

| | |
|---|---|
| 6010 | SHERMAN BALCH |
| 6016 | DAVID KNITTEL |
| 6022 | SCOTT HERBERT |
| 6034 | OCCUPANT UNKNOWN |
| 6177 | DOUGLAS ALLEN |
| 6187 | MICHAEL GIPSON |
| 6192 | OCCUPANT UNKNOWN |
| 6233 | DANIEL MORAIS |
| 6245 | BRUCE BROGDEN |
| 6249 | OCCUPANT UNKNOWN |
| 6291 | OCCUPANT UNKNOWN |
| 6300 | JANET LINFOOT |
| 6306 | SHUN CHANG |
| 6322 | ARLIN VANDERBILT |
| 6330 | DENNIS HORAN |
| 6344 | SUE ADAMS |
| 6350 | DONALD GIGLI |
| 6352 | DOUGLAS STOCKER |
| 6409 | CLARITY LLC |
| | OCCUPANT UNKNOWN |
| 6443 | GREG JEBEJIAN |
| 6511 | OCCUPANT UNKNOWN |
| 6525 | MESA TRADING COMPANY |
| | PHYLLIS COUPER |
| 6615 | BETH GORDON |
| | DAVID DAHLHEIM |
| 6627 | GEORGE HENDRIX |
| 6639 | OCCUPANT UNKNOWN |
| 6651 | PATRICIA KESSERLING |
| 6656 | ASSEMBLY OF GOD |
| 6699 | PETER BAILEY |
| 6723 | BUD BARLOW |
| 6745 | ROBERT DEES |
| 6748 | SILVESTRE LICLICAN |
| 6767 | ALBERT SCHORNO |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| ✓ | - | Cole Information Services |

## MINNIE ST 2008

1000 ALEX SPOTORNO

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 2008

| | |
|---|---|
| 6010 | SHERMAN BALCH |
| | TATE BALCH LLC |
| 6016 | ADAM SMITH-TOOMEY |
| | BILL TOOMEY |
| | FULL COUNT INVESTMENTS |
| 6022 | OCCUPANT UNKNOWN |
| 6034 | OCCUPANT UNKNOWN |
| 6187 | DOUG ALLEN |
| 6192 | KIRK DALTON |
| 6233 | DANIEL MORAIS |
| 6245 | BRUCE BROGDEN |
| 6249 | ROBERT ANTRACCOLI |
| 6291 | JAMES KASCHMITTER |
| 6300 | JACK KILBURN |
| 6306 | RICHARD DAVIS |
| 6322 | JMA NOTARY SERVICE |
| | TODD MOORE |
| 6330 | DENNIS HORAN |
| | JULIA SANDERSON REALTOR |
| 6344 | JERRY WAGNER |
| 6350 | DONALD GIGLI |
| | DONALD GIGLI |
| | GIGLIS HAY & GRAIN CO |
| 6352 | JESUS MORENO |
| 6409 | IDEAS BY HAND |
| | WILLIAM HAND |
| 6443 | JUSTIN SAVAGE |
| | MATTHEW ROBERTS |
| | MAURICE COOK |
| 6511 | OCCUPANT UNKNOWN |
| 6525 | PHYLLIS COUPER |
| 6615 | BETH GORDON |
| | WYCLIFFE BIBLE TRANSLATORS |
| 6627 | GEORGE HENDRIX |
| 6639 | HANS NEGD |
| 6651 | KELLER HOWELL |
| 6656 | FAITH CHAPEL ASSEMBLY OF GOD |
| 6658 | GLENN MATLOCK |
| 6699 | PETER BAILEY |
| 6723 | BUD BARLOW |
| 6745 | ROBERT DEES |
| | TRACY WACHT |
| 6748 | DEE LICLICAN |
| 6767 | ALBERT SCHORNO |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 2003

| | |
|---|---|
| 6010 | SHERMAN BALCH |
| 6016 | BILL TOOMEY |
| | LANCE WILLS |
| | MARC SMITH |
| 6022 | JAMES MCCARTHY |
| 6028 | JAY LOFTHOUSE-ZEIS |
| 6034 | THOMAS DAGGETT |
| 6187 | DOUG ALLEN |
| 6192 | KIRK DALTON |
| 6233 | DANIEL MORAIS |
| 6245 | BRUCE BROGDEN |
| 6249 | ROBERT ANTRACCOLI |
| 6291 | OCCUPANT UNKNOWN |
| 6300 | JANET LINFOOT |
| | LINFOOT J DVM |
| 6306 | RICHARD DAVIS |
| 6322 | SHARON SMITH |
| 6330 | KELLY HORAN |
| 6344 | JERELYN PROPERTY MANAGEMENT |
| | JERRY WAGNER |
| 6350 | DONALD GIGLI |
| | GIGLIS HAY & GRAIN CO |
| 6352 | OCCUPANT UNKNOWN |
| 6443 | MAURICE COOK |
| 6511 | EARL SIMPSON |
| 6525 | RENNIE COUPER |
| 6615 | DONALD DAHLHEIM |
| | PAULA SALTZMAN |
| | WYCLIFFE BIBLE TRANSLATORS |
| 6627 | GEORGE HENDRIX |
| 6639 | HANS NEGD |
| 6651 | BILL K HOWELL |
| | KELLER HOWELL |
| 6656 | FAITH CHAPEL |
| 6658 | GLENN MATLOCK |
| 6699 | PETER BAILEY |
| 6723 | KEITH BARLOW |
| 6745 | SUSAN DEES |
| | TRACY WACHT |
| 6748 | DONALD MORTENSEN |
| 6767 | ALBERT SCHORNO |

| Target Street | Cross Street | Source |
| --- | --- | --- |
| ✓ | - | Cole Information Services |

## MINNIE ST 1999

1000 ALEX SPOTORNO

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 1999

| | |
|---|---|
| 6010 | SHERMAN BALCH |
| 6016 | BILL TOOMEY |
| | DAVID KNITTEL |
| 6022 | BRIAN BENNETT |
| 6187 | DOUG ALLEN |
| | OCCUPANT UNKNOWN |
| 6233 | DANIEL MORAIS |
| | OCCUPANT UNKNOWN |
| 6245 | BRUCE BROGDEN |
| 6249 | ROBERT ANTRACCOLI |
| 6300 | LINFOOT J DVM |
| | LOIS KILBURN |
| 6306 | RICHARD DAVIS |
| 6344 | JERRY WAGNER |
| 6350 | DONALD GIGLI |
| 6352 | JESUS MORENO |
| 6409 | DAVID BRODY |
| | TEMPLE ASSOCIATES |
| 6443 | MATTHEW ROBERTS |
| | MAURICE COOK |
| 6525 | PHYLLIS COUPER |
| | RENNIE COUPER |
| 6615 | BETH GORDON |
| | WYCLIFFE BIBLE TRANSLATORS |
| 6627 | GEORGE HENDRIX |
| 6639 | HANS NEGD |
| 6651 | GRAHAM HOLMES |
| | OCCUPANT UNKNOWN |
| 6656 | ASSEMBLY OF GOD |
| | FAITH CHAPEL |
| 6658 | GLENN MATLOCK |
| 6699 | PETER BAILEY |
| 6723 | BUD BARLOW |
| 6748 | DEE LICLICAN |
| 6767 | ALBERT SCHORNO |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 1995

| | |
|---|---|
| 6010 | LANINI, DONALD H |
| 6016 | NATIONAL FILM PROCESSING |
| | TOOMEY, BILL |
| 6028 | MCKAY, ELEANOR |
| 6034 | DAGGETT, BARBARA P |
| 6187 | DENKELDORPH, RONALDO A |
| | KING, RONALD A |
| 6192 | TRIMMER, BEULAH M |
| 6233 | RAYNOR, WILLIAM R |
| 6245 | GARCIA, RICHARD |
| | VINTAGE CONCRETE |
| 6249 | ANTRACCOLI, ROBERT L |
| 6260 | SCHAAF, MICHAEL |
| 6273 | OCCUPANT UNKNOWNN |
| 6291 | KASCHMITTER, JAMES |
| 6300 | J LINFOOT DVM |
| | TALASKA, GEORGE |
| 6306 | DAVIS, RICHARD M |
| 6322 | SMITH, SHARON E |
| 6344 | SMITH, ROGER D |
| 6350 | OCCUPANT UNKNOWNN |
| 6352 | ALISAL PET CLINIC |
| | ZUCCO, C A |
| 6409 | TEMPLE ASSOCIATES |
| | TINKHAM, JOHN A |
| 6443 | COOK, MAURICE C |
| 6615 | DAHLHEIM, D H |
| | MCCALLUM, STANLEY Q |
| | MILLER, LARRY |
| | WYCLIFFE BIBLE TRANSLATORS |
| 6627 | HENDRIX, JASON |
| 6639 | NEGD, HANS |
| 6651 | HOWELL, K W |
| 6656 | FAITH CHAPEL |
| 6658 | ADCOCK, BUD |
| 6699 | BAILEY, PETER M |
| 6723 | BARLOW, BUD |
| 6745 | FLETCHER, FERRELL S |
| 6748 | MORTENSEN, WILLIAM |
| 6767 | MCMICHAEL, JOHN C |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Cole Information Services |

# ALISAL ST 1992

| | |
|---|---|
| 6010 | LANINI, DONALD H |
| 6016 | TOOMEY, BILL |
| 6187 | DENKELDORPH, RONALDO A |
| 6260 | SCHAAF, MICHAEL |
| 6273 | SPENCER, RICK A |
| 6291 | KASCHMITTER, JAMES |
| 6300 | LINFOOT, JANET M |
| 6306 | DAVIS, RICHARD M |
| 6330 | QUALITY PAINT&DECO |
| 6344 | KENNEDY, JERRY |
| 6409 | TEMPLE ASSOCIATES |
| 6443 | COOK, MAURICE C |
| 6615 | DAHLHEIM, CAROL |
| 6627 | HENDRIX, MIA |
| 6639 | NEGD, HANS |
| 6656 | ASSEMBLY OF GOD |
| 6699 | BAILEY, PETER M |
| 6723 | BARLOW, BUD |
| 6748 | MORTENSEN, WILLIAM |
| 6767 | MCMICHAEL, JOHN C |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

# ALISAL ST 1989

## ALISAL 94566
## PLEASANTON

| | | | |
|---|---|---|---|
| 6010 | LANINI Donald H | 846-2702 | |
| **6016** | **★AMER TRAVEL INCNTVS** | **462-7741** | **+9** |
| | **★NATL PROCESSING** | **462-7740** | **+9** |
| | SMITH P | 462-6022 | 3 |
| | SMITHTOOMEY Devon | 462-8980 | 3 |
| 6028 | XXXX | 00 | |
| 6034 | MCWILLIAMS Gary | 462-5079 | 7 |
| 6187 | DENKELDORPH Ronaldo | 846-8326 | 5 |
| | **★SCOTT DONALD R** | **846-5360** | |
| | **★SCOTT OVERHEAD DOOR** | **846-5360** | |
| 6192 | XXXX | 00 | |
| 6233 | GODFREY R S | 426-8599 | +9 |
| 6245 | GARCIA Richard | 846-2723 | +9 |
| 6249 | ANTRACCOLI Robt L | 846-3369 | |
| 6267 | XXXX | 00 | |
| 6273 | BARNES Shorty | 846-4557 | |
| 6291 | KASCHMITTER James | 426-1162 | 7 |
| 6300 | LINFOOT J DVM | 846-4708 | |
| 6306 | DAVIS Richard M | 846-9011 | |
| 6322 | CHIRRICK Joan | 846-4377 | |
| | CHIRRICK John M | 846-4377 | |
| **6330** | **★QUALITY PAINT&DECO** | **846-0451** | 7 |
| 6344 | KENNEDY Jerry | 462-1699 | |
| 6350 | XXXX | 00 | |
| **6409** | **★TEMPLE ASSOCIATES** | **846-8428** | |
| 6443 | COOK M C | 846-3799 | |
| 6511 | XXXX | 00 | |
| 6525 | COUPER Rennie C | 462-4931 | |
| 6615 | DAHLHEIM Donald H | 846-7303 | |
| 6627 | HENDRIX George | 846-2426 | 4 |
| | HENDRIX Mia | 846-5335 | 4 |
| 6639 | NEGD Hans | 462-2547 | 7 |
| 6651 | XXXX | 00 | |
| **6656** | **★ASSEMBLY OF GOD** | **846-8650** | 4 |
| | **★FAITH CHAPEL** | **846-8650** | |
| 6658 | XXXX | 00 | |
| 6699 | BAILEY Peter M | 846-4921 | |
| 6723 | BARLOW Bud | 846-2530 | |
| | BARLOW Chilli | 846-2530 | |
| 6745 | XXXX | 00 | |
| 6748 | MORTENSEN Wm | 846-5715 | |
| 6767 | MCMICHAEL John C | 462-4317 | 8 |
| ★ | 8 BUS 34 RES | 4 NEW | |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

## ALISAL ST 1985

# ALISAL 94566
# PLEASANTON

| | | | |
|---|---|---|---|
| 6010 | LANINI DONALD H | 846-2702 | 7 |
| 6016 | SMITH P | 462-6022 | 3 |
| | SMITHTOOMEY DEVON | 462-8980 | 3 |
| 6028 | MENDEZ DON | 846-5144 | |
| 6034 | XXXX | 00 | |
| 6187 | DENKELDORPH RONALDO | 846-8326 | +5 |
| 6192 | KAHLER LINDA M | 462-2963 | +5 |
| | NOLAN WILLIAM J | 462-2963 | +5 |
| 6233 | XXXX | 00 | |
| 6245 | BERRI BOB | 846-5390 | |
| 6249 | ANTRACCOLI ROBT L | 846-3369 | 9 |
| 6267 | XXXX | 00 | |
| 6273 | BARNES SHORTY | 846-4557 | 7 |
| 6291 | MILLER WILLIAM C | 846-9444 | 4 |
| 6300 | **LINFOOT WM R DVM** | **846-4708** | |
| | **SANGUIS STABLES** | **846-9722** | 2 |
| 6306 | DAVIS RICHARD M | 846-9011 | |
| 6322 | CHIRRICK JOHN M | 846-4377 | +5 |
| 6330 | BREGERS R E | 846-0451 | |
| | HORAN DENNIS J | 846-7070 | |
| 6344 | KENNEDY JERRY | 462-1699 | |
| 6350 | XXXX | 00 | |
| 6409 | **TEMPLE ASSOCIATES** | **846-8428** | 7 |
| 6443 | COOK M C | 846-3799 | |
| 6511 | SIMPSON EARL W | 846-5091 | |
| 6525 | COUPER RENNIE C | 462-4931 | |
| | HESS GEORGE | 462-8650 | +5 |
| 6615 | DAHLHEIM DAN S | 846-9340 | 4 |
| | DAHLHEIM DAVID J | 846-9013 | 9 |
| | DAHLHEIM DONALD H | 846-7303 | 8 |
| | **DOUBLE D TREE SRGRY** | **846-9623** | 2 |
| 6627 | HENDRIX GEORGE | 846-2426 | 4 |
| | HENDRIX MIA | 846-5335 | 4 |
| 6651 | XXXX | 00 | |
| 6656 | **ASSEMBLY OF GOD** | **846-8650** | 4 |
| | **FAITH CHAPEL** | **846-8650** | 9 |
| 6658 | BROWN R GLEN REV | 462-4009 | 1 |
| 6699 | BAILEY PETER M | 846-4921 | |
| 6723 | BARLOW O M JR | 846-2530 | |
| 6745 | DODD JOSEPH | 462-3152 | +5 |
| 6748 | MORTENSEN WM | 846-5715 | |
| 6767 | XXXX | 00 | |
| ★ | 6 BUS 36 RES | 6 NEW | |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

## ALISAL ST 1980

ALISAL 94566
PLEASANTON

| | | | |
|---|---|---|---|
| 6010 | HAIGHT ALBERT SR | 846-2702 | 7 |
| | LANINI DONALD H | 846-2702 | 7 |
| 6016 | BUTTERFIELD F G | 846-3671 | 5 |
| 6028 | MENDEZ DON | 846-5144 | 2 |
| 6034 | XXXX | 00 | |
| 6187 | GIBBONS S J | 462-6057 | +0 |
| | LUX BETTIE | 462-0623 | +0 |
| 6192* | CONTINENTAL APPRSL | 462-4966 | 8 |
| | FALCK ROBERT B | 846-6433 | 8 |
| 6233* | MARKS TRANSPTN | 462-7670 | +0 |
| 6245 | BERRI BOB | 846-5390 | 5 |
| 6249 | ANTRACCOLI R L JR | 462-0416 | 9 |
| | ANTRACCOLI ROBT L | 846-3369 | 9 |
| 6267 | XXXX | 00 | |
| 6273 | BARNES MARK | 846-1322 | 8 |
| | BARNES SHORTY | 846-4557 | 7 |
| 6291 | HUGHES PHIL | 846-7187 | 9 |
| | PERRIN S M | 846-7187 | +0 |
| 6300 | LINFOOT WM R DVM | 846-4708 | |
| 6306 | DAVIS RICHARD M | 846-9011 | 2 |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

# ALISAL ST 1980

..ALISAL 94566 CONT..

| | | | |
|---|---|---|---|
| 6322 | SOUSA LARRY J | 462-1709 | 4 |
| 6330 | BREGERS R E | 846-0451 | 5 |
| | HORAN DENNIS J | 846-7070 | 5 |
| 6344 | KENNEDY JERRY | 462-1699 | 5 |
| 6350 | GIGLI D | 846-6636 | |
| | GIGLI RICHARD | 846-3974 | +0 |
| 6352 | HOLTZEN K | 462-0677 | +0 |
| 6409 | TEMPLE DONALD L | 846-8428 | 7 |
| 6443 | COOK M C | 846-3799 | 3 |
| | CUNNINGHAM JON O | 462-4143 | +0 |
| 6511 | SIMPSON EARL W | 846-5091 | |
| 6525 | COUPER RENNIE C | 462-4931 | 5 |
| 6615 | DAHLHEIM DAVID J | 846-9013 | 9 |
| | DAHLHEIM DONALD H | 846-7303 | 8 |
| | DAHLHEIM DONALD H | 846-9623 | 7 |
| 6627 | XXXX | 00 | |
| 6651 | CONNERS DANIEL | 462-4412 | 7 |
| 6656* | FAITH CHAPEL | 846-8650 | 9 |
| 6699 | BAILEY PETER M | 846-4921 | |
| 6723 | BARLOW O M JR | 846-2530 | |
| 6745 | MILLSPAUGH A G | 846-4543 | |
| | MILLSPAUGH EUGENE G | 846-9570 | 7 |
| 6748 | MORTENSEN WM | 846-5715 | |
| 6767 | XXXX | 00 | |

* 3 BUS 41 RES 7 NEW

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

# ALISAL ST 1975

ALISAL 94566 PLEASANTON

| | | |
|---|---|---|
| 6016 | BUTTERFIELD F G | 846-3671+5 |
| 6028 | MENDEZ DON | 846-5144 2 |
| 6034 | JENSEN S H | 846-8813 |
| 6187 | SANDELL LOIS C | 846-6816+5 |
| 6192 | BLACK S R | 846-8054 |
| | JOHNSON B A | 846-8054 |
| 6233 | SILVA DAVID J | 846-8111+5 |
| 6245 | BERRI BOB | 846-5390+5 |
| 6260 | XXXX | 00 |
| 6267 | ANTRACCOLI ROBT L | 846-3369 |
| | JOHNSON T R | 846-5814 |
| 6273 | ALLEN RUTH M MRS | 846-4557 |
| 6279 | PHILIS ROBT | 462-1860 3 |
| 6289 | XXXX | 00 |
| 6291 | XXXX | 00 |
| 6300 | LINFOOT WM R DVM | 846-4708 |
| 6306 | DAVIS RICHARD M | 846-9011 2 |
| 6322 | SOUSA LARRY J | 462-1709 4 |
| 6330 | BREGERS R E | 846-0451+5 |
| | HORAN DENNIS J | 846-7070+5 |
| 6344 | KENNEDY JERRY | 462-1699+5 |
| 6350 | GIGLI D | 846-6636 |
| 6409 | TAYLOR LAWRENCE B | 846-4152 |
| 6443 | COOK M C | 846-3799 3 |
| 6511 | SIMPSON EARL W | 846-5091 |
| 6525 | COUPER RENNIE C | 462-4931+5 |
| 6615 | DAHLHEIM DONALD H | 846-9623+5 |
| | OCALLAGHAN MICHAEL | 462-3785+5 |
| 6639 | XXXX | 00 |

| Target Street | Cross Street | Source |
|---|---|---|
| - | ✓ | Haines Criss-Cross Directory |

## ALISAL ST 1975

..ALISAL 94566 CONT..

6656*FIRST ASMBLY OF GOD846-8650
6699 BAILEY PETER M 846-4921
6723 BARLOW O M JR 846-2530
6745 MILLSPAUGH A G 846-4543
6748 MORTENSEN WM 846-5715
6767 FRAZER JACK W 846-4582
* 1 BUS 34 RES 10 NEW

# APPENDIX G

## File Review Excerpts

APPENDIX G

CITY COUNCIL OF THE CITY OF PLEASANTON

ALAMEDA COUNTY, CALIFORNIA

ORDINANCE NO. 1751

**AN ORDINANCE APPROVING THE COMBINATION OF PLANNED UNIT DEVELOPMENT (PUD) ZONING DISTRICTS FOR THE HAPPY VALLEY SPECIFIC PLAN AREA, INCLUDING PUD-MDR (MEDIUM DENSITY RESIDENTIAL), PUD-LDR (LOW DENSITY RESIDENTIAL), PUD-SRDR (SEMI-RURAL DENSITY RESIDENTIAL), PUD-GC (GOLF COURSE), AND PUD-A/OS (AGRICULTURE/OPEN SPACE), AS FILED UNDER CASE RZ-97-01**

WHEREAS, the City of Pleasanton has applied for a combination of PUD prezoning for different areas within the 860-acre Happy Valley Specific Plan area, which area is located south of Sycamore Road in the vicinity of Alisal Street and Happy Valley Road as indicated on Exhibit "A"; and

WHEREAS, the Planning Commission of the City of Pleasanton, following noticed public hearings on April 22 and April 29, 1998, found the combination of PUD zoning districts for the Happy Valley Specific Plan area to be consistent with the Pleasanton General Plan and Happy Valley Specific Plan; and

WHEREAS, after holding a noticed public hearing on June 16, 1998, the City Council, after considering all public testimony, relevant exhibits, and recommendations of the City staff concerning this proposal, approved a Final Environmental Impact Report prepared for this prezoning; and

WHEREAS, the City Council determined that the prezoning of the subject properties to the combination of PUD zoning designations would provide the Happy Valley area the opportunity to annex into the City of Pleasanton and to develop in conformance with the land use designations and policies of the General Plan and Happy Valley Specific Plan and in conformance with the prevailing development pattern of the surrounding area.

THE CITY COUNCIL OF THE CITY OF PLEASANTON DOES HEREBY ORDAIN AS FOLLOWS:

Section 1: Approves the Planned Unit Development (PUD) zoning districts for the Happy Valley Specific Plan area, including PUD-MDR (Medium Density Residential), PUD-LDR (Low Density Residential), PUD-SRDR (Semi-Rural Density Residential), PUD-GC (Golf Course), and PUD-A/OS (Agriculture/Open Space), as filed under Case RZ-97-01.

Section 2: Approves the development standards and design guidelines applicable to each of the five PUD zoning districts, which shall be the same as those presented in the Happy Valley Specific Plan, as that Plan may be amended. The following Specific Plan sections are hereby referenced for this purpose:

PUD-MDR: Section V.B.1.
PUD-LDR: Section V.B.2.
PUD-SRDR: Section V.B.3.
PUD-GC: Section V.B.4.
PUD-A/OS: Section V.B.5.

Section 3: The Zoning Map of the City of Pleasanton dated April 18, 1960, on file with the City Clerk, designating and dividing the City into zoning districts is hereby amended by Zoning Unit Map #437, attached hereto as Exhibit "A", dated June 16, 1998, and incorporated herein by reference.

Section 4: The City staff is directed to cause a Notice of Determination to be filed pursuant to Section 5.4(g) of Resolution No. 77-66.

Section 5: A summary of this ordinance shall be published once within fifteen (15) days after its adoption in "The Tri-Valley Herald," a newspaper of general circulation published in the City of Pleasanton, and the complete ordinance shall be posted for fifteen (15) days in the City Clerk's office within fifteen (15) days after its adoption.

Section 6: This ordinance shall be effective thirty (30) days after the date of its final passage and adoption; to the extent that properties are currently in the unincorporated areas of Alameda County, the provisions of Section 3 shall not take effect unless and until such properties are annexed into the City of Pleasanton.

INTRODUCED at a regular meeting of the City Council of the City of Pleasanton on June 16, 1998.

ADOPTED at a regular meeting of the City Council of the City of Pleasanton on July 7, 1998 by the following vote:

AYES: Councilmembers - Ayala, Dennis, Michelotti, Pico, and Mayor Tarver
NOES: None
ABSENT: None
ABSTAIN: None

BEN C. TARVER, MAYOR

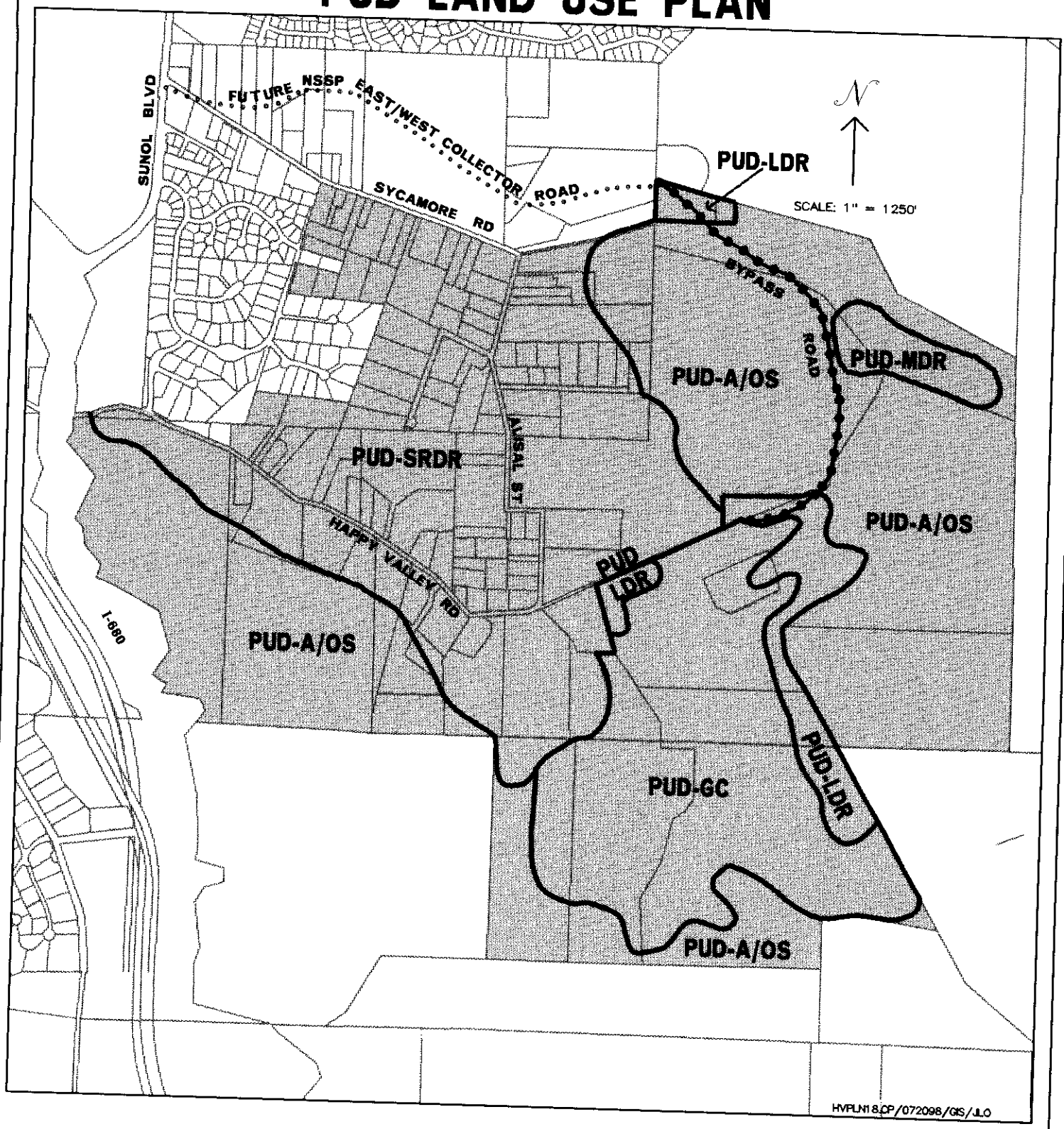
ATTEST:

Peggy L. Ezidro, City Clerk

APPROVED AS TO FORM:

Michael H. Roush, City Attorney

# EXHIBIT - A
# PUD LAND USE PLAN




## LEGEND

MAP NO. 437

PUD: Planned Unit Development

PUD-MDR: Medium Density Residential

PUD-LDR: Low Density Residential

PUD-SRDR: Semi-Rural Density Residential

PUD-GC: Golf Course

PUD-A/OS: Agriculture/Open Space

PLEASANTON CITY OF PLANNED PROGRESS

## OWNER'S STATEMENT

THE UNDERSIGNED HEREBY STATE THAT THEY ARE THE OWNERS OF THE LANDS DELINEATED UPON THIS MAP ENTITLED "LOT LINE ADJUSTMENT NO. PLLA-__", CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA, CONSISTING OF TWO (2) SHEETS, THIS STATEMENT BEING ON SHEET 1 THEREOF; THAT THEY HAVE CAUSED THIS MAP TO BE PREPARED; AND THAT THEY CONSENT TO THE PREPARATION AND RECORDATION OF THIS LOT LINE ADJUSTMENT.

OWNERS:

ALEX V. SPOTORNO, TRUSTEE OF THE ALEX V. SPOTORNO TRUST, UTD DECEMBER 12, 1986, AS AMENDED AND RESTATED ON SEPTEMBER 19, 2005, AS TO PARCEL TWO

BY: _____ DATE: Jan 31 11
NAME: ALEX V. SPOTORNO, TRUSTEE

AVS RANCH LLC, A CALIFORNIA LIMITED LIABILTY COMPANY AND ALEX V. SPOTORNO, TRUSTEE OF THE ALEX V. SPOTORNO TRUST, UTD 12/11/86, AS THEIR INTEREST MAY APPEAR, AS TO PARCEL ONE

BY: _____ DATE: Jan 31-11
NAME:
ALEX V. SPOTORNO, TRUSTEE

## OWNER'S ACKNOWLEDGEMENT

STATE OF CALIFORNIA
COUNTY OF Alameda

ON 1/31, 2011 BEFORE ME, M. L. Chan,
A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED
Alex V. Spotorno, WHO PROVED TO ME
ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND

SIGNATURE: _____
PRINT: M. L. Chan
MY COMMISSION NUMBER: 1919522
MY COMMISSION EXPIRES: January 27, 2015
PRINCIPAL COUNTY OF BUSINESS: Alameda

## BENEFICIARY'S STATEMENT

THE UNDERSIGNED, DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT, AS TRUSTEE UNDER THOSE CERTAIN DEEDS OF TRUST RECORDED JUNE 30, 2009, SERIES 2009208365, OFFICIAL RECORDS OF ALAMEDA COUNTY DOES HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF SAID LOT LINE ADJUSTMENT, THIS MAP, AND JOINS IN ALL DEDICATIONS THEREON.

IN WITNESS WHEREOF, THE UNDERSIGNED HAS EXECUTED THIS STATEMENT ON _____, 2011 BY ITS DULY AUTHORIZED OFFICERS AS BENEFICIARY:

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

BY: _____ BY: _____
TITLE: _____ TITLE: _____

## BENEFICIARY'S ACKNOWLEDGEMENT

STATE OF CALIFORNIA
COUNTY OF _____

ON _____, 2011 BEFORE ME, _____,
A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED
_____, WHO PROVED TO ME
ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND

SIGNATURE: _____
PRINT: _____
MY COMMISSION NUMBER: _____
MY COMMISSION EXPIRES: _____
PRINCIPAL COUNTY OF BUSINESS: _____

## OWNER'S ACKNOWLEDGEMENT

STATE OF CALIFORNIA
COUNTY OF _____

ON _____, 2011 BEFORE ME, _____,
A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED
_____, WHO PROVED TO ME
ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND

SIGNATURE: _____
PRINT: _____
MY COMMISSION NUMBER: _____
MY COMMISSION EXPIRES: _____
PRINCIPAL COUNTY OF BUSINESS: _____

## SURVEYOR'S STATEMENT

THIS LOT LINE ADJUSTMENT WAS PREPARED BY ME OR UNDER MY DIRECTION AND WAS COMPILED FROM RECORD DATA.

LICENSED LAND SURVEYOR
CHARLES SELLMAN
No. 5186
Exp. 06-30-11
STATE OF CALIFORNIA

01-06-2011
CHARLES F. SELLMAN, L.S. NO. 5186 DATE
REGISTRATION EXPIRES: JUNE 30, 2011

## TRUSTEE'S STATEMENT

THE UNDERSIGNED, PLACER TITLE COMPANY, AS TRUSTEE UNDER THOSE CERTAIN DEEDS OF TRUST RECORDED JUNE 30, 2009, SERIES 2009208364, OFFICIAL RECORDS OF ALAMEDA COUNTY DOES HEREBY CONSENT TO THE PREPARATION AND RECORDATION OF SAID LOT LINE ADJUSTMENT, THIS MAP, AND JOINS IN ALL DEDICATIONS THEREON.

IN WITNESS WHEREOF, THE UNDERSIGNED HAS EXECUTED THIS STATEMENT ON _____, 2011 BY ITS DULY AUTHORIZED OFFICERS AS TRUSTEE:

PLACER TITLE COMPANY

BY: _____ BY: _____
TITLE: _____ TITLE: _____

## TRUSTEE'S ACKNOWLEDGEMENT

STATE OF CALIFORNIA
COUNTY OF _____

ON _____, 2011 BEFORE ME, _____,
A NOTARY PUBLIC IN AND FOR SAID COUNTY AND STATE, PERSONALLY APPEARED
_____, WHO PROVED TO ME
ON THE BASIS OF SATISFACTORY EVIDENCE TO BE THE PERSON(S) WHOSE NAME(S) IS/ ARE SUBSCRIBED TO THE WITHIN INSTRUMENT AND ACKNOWLEDGED TO ME THAT HE/ SHE/ THEY EXECUTED THE SAME IN HIS/ HER/ THEIR AUTHORIZED CAPACITY(IES), AND THAT BY HIS /HER /THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S) OR THE ENTITY ON BEHALF OF WHICH THE PERSON(S) ACTED, EXECUTED THE INSTRUMENT.

I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF CALIFORNIA THAT THE FOREGOING PARAGRAPH IS TRUE AND CORRECT.

WITNESS MY HAND

SIGNATURE: _____
PRINT: _____
MY COMMISSION NUMBER: _____
MY COMMISSION EXPIRES: _____
PRINCIPAL COUNTY OF BUSINESS: _____

## CITY ENGINEER'S STATEMENT

THIS MAP CONFORMS WITH THE REQUIREMENTS OF THE SUBDIVISION MAP ACT PURSUANT TO SECTION 66412(d) OF THE GOVERNMENT CODE AND LOCAL ORDINANCES OF THE CITY OF PLEASANTON.

REGISTERED PROFESSIONAL ENGINEER
JAMES J. KELCOURSE
No. 38328
Exp. 03/31/2011
CIVIL
STATE OF CALIFORNIA

2/1/2011
JAMES J. KELCOURSE, R.C.E. 38328 DATE
REGISTRATION EXPIRES: 3-31-11
CITY ENGINEER, CITY OF PLEASANTON
ALAMEDA COUNTY, CALIFORNIA

## TITLE COMPANY STATEMENT

FIRST AMERICAN TITLE COMPANY HEREBY STATES THAT THIS MAP IS A TRUE AND CORRECT COPY OF EXHIBIT TO THE DEED TO BE RECORDED CONCURRENTLY HEREWITH.

BY: _____ DATE: _____

# EXHIBIT
# LOT LINE ADJUSTMENT NO. PLLA-105

BEING AN ADJUSTMENT OF THE PARCEL DESCRIBED IN THE DEED RECORDED IN DOCUMENT NO. 2009208363 AND THE PARCEL DESCRIBED IN THE DEED RECORDED IN DOCUMENT NO. 95297938 OFFICIAL RECORDS OF ALAMEDA COUNTY

CITY OF PLEASANTON
ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR & ASSOCIATES
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
(925) 227-9100
AUGUST 2010

JOB NO. 091097 SHEET 1 OF 2 SHEETS

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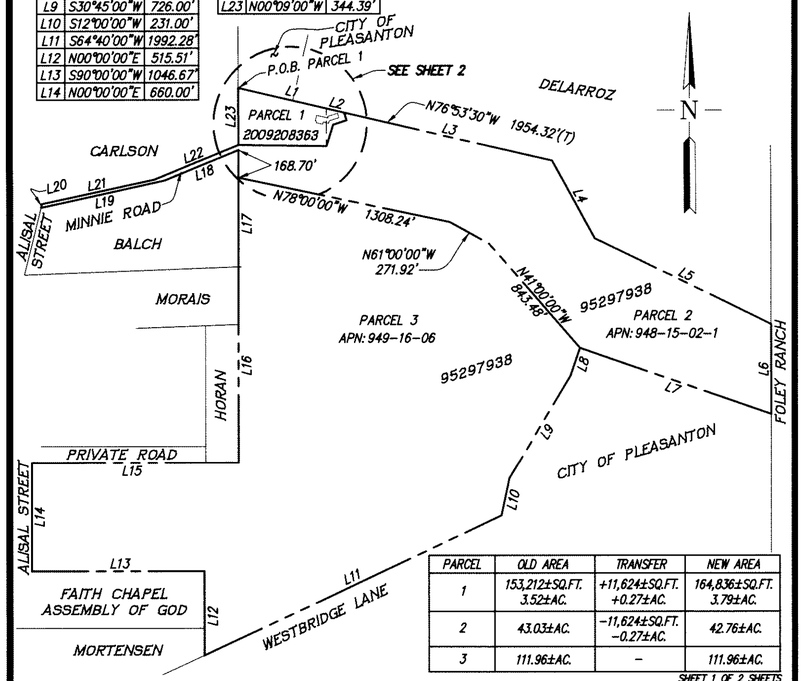
| Line Table | | |
|---|---|---|
| Line | Bearing | Distance |
| L1 | S76°53'30"E | 550.00' |
| L2 | S76°53'30"E | 110.00' |
| L3 | S76°53'30"E | 1294.32' |
| L4 | S28°33'30"E | 540.34' |
| L5 | S63°54'00"E | 1190.20' |
| L6 | S00°04'00"E | 547.84' |
| L7 | N70°49'20"W | 1227.64' |
| L8 | S18°58'55"W | 179.12' |
| L9 | S30°45'00"W | 726.00' |
| L10 | S12°00'00"W | 231.00' |
| L11 | S64°40'00"W | 1992.28' |
| L12 | N00°00'00"E | 515.51' |
| L13 | S90°00'00"W | 1046.67' |
| L14 | N00°00'00"E | 660.00' |

| Line Table | | |
|---|---|---|
| Line | Bearing | Distance |
| L15 | S90°00'00"E | 1254.00' |
| L16 | N00°00'00"E | 1191.52' |
| L17 | N00°00'00"E | 545.10' |
| L18 | S67°25'00"W | 484.90' |
| L19 | S77°40'00"W | 767.75' |
| L20 | N13°40'00"E | 22.25' |
| L21 | N77°40'00"E | 700.00' |
| L22 | N67°25'00"E | 550.90' |
| L23 | N00°09'00"W | 344.39' |

## LEGEND

- BOUNDARY OF LOT LINE ADJUSTMENT
- NEW LOT LINE
- EXISTING LOT LINE BEING DELETED
- ADJACENT LOT LINES
- 17.00' NEW DATA
- P.O.B. POINT OF BEGINNING




| PARCEL | OLD AREA | TRANSFER | NEW AREA |
|---|---|---|---|
| 1 | 153,212±SQ.FT. 3.52±AC. | +11,624±SQ.FT. +0.27±AC. | 164,836±SQ.FT. 3.79±AC. |
| 2 | 43.03±AC. | −11,624±SQ.FT. −0.27±AC. | 42.76±AC. |
| 3 | 111.96±AC. | – | 111.96±AC. |

SHEET 1 OF 2 SHEETS

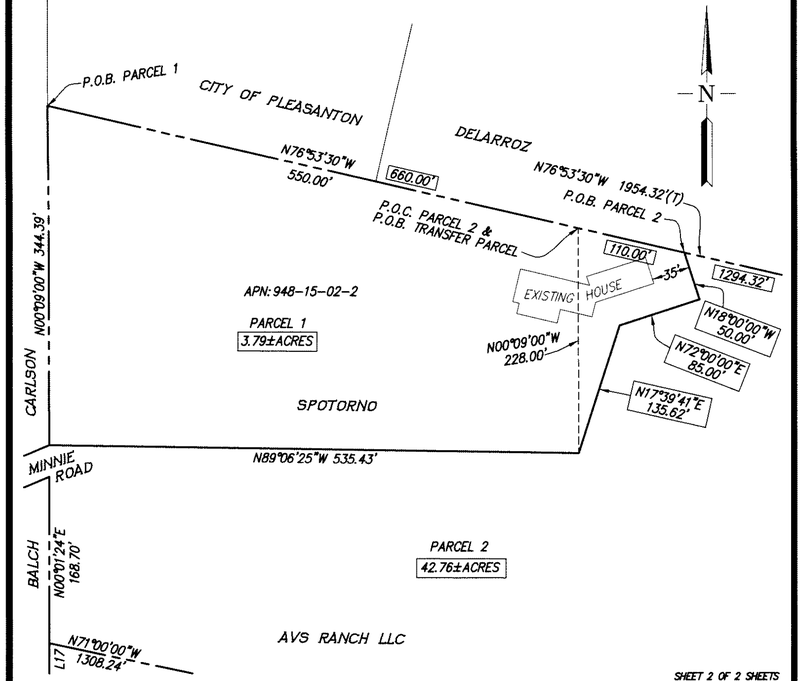
EXHIBIT B
PLAT TO ACCOMPANY LEGAL DESCRIPTIONS
LOT LINE ADJUSTMENT NO. PLLA-105
SPOTORNO PARCELS
CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR
ENGINEERS ▪ PLANNERS ▪ SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

| SCALE: | DATE: | JOB NO.: |
|---|---|---|
| 1"=600' | 08-05-10 | 091097 |

## LEGEND

- BOUNDARY OF LOT LINE ADJUSTMENT
- NEW LOT LINE
- EXISTING LOT LINE BEING DELETED
- ADJACENT LOT LINES
- 17.00' NEW DATA
- P.O.B. POINT OF BEGINNING
- P.O.C. POINT OF COMMENCEMENT

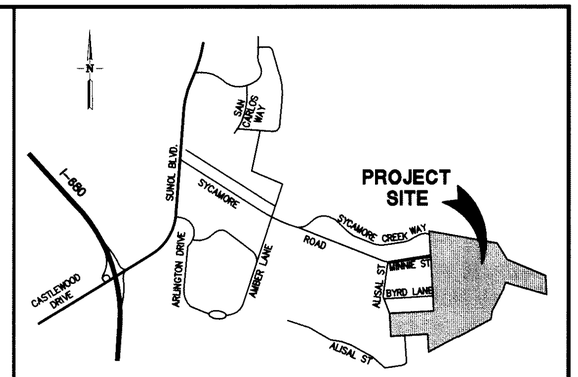



SHEET 2 OF 2 SHEETS

EXHIBIT B
PLAT TO ACCOMPANY LEGAL DESCRIPTIONS
LOT LINE ADJUSTMENT NO. PLLA-105
SPOTORNO PARCELS
CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR
ENGINEERS ▪ PLANNERS ▪ SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

| SCALE: | DATE: | JOB NO.: |
|---|---|---|
| 1"=100' | 08-05-10 | 091097 |




VICINITY MAP
NOT TO SCALE

# EXHIBIT
# LOT LINE ADJUSTMENT NO. PLLA-105

BEING AN ADJUSTMENT OF THE PARCEL DESCRIBED IN THE DEED RECORDED IN DOCUMENT NO. 2009208363 AND THE PARCEL DESCRIBED IN THE DEED RECORDED IN DOCUMENT NO. 95297938 OFFICIAL RECORDS OF ALAMEDA COUNTY

CITY OF PLEASANTON
ALAMEDA COUNTY, CALIFORNIA

RUGGERI-JENSEN-AZAR & ASSOCIATES
CIVIL ENGINEERS, PLANNERS, SURVEYORS
PLEASANTON, CALIFORNIA
(925) 227-9100
AUGUST 2010

JOB NO. 091097 SHEET 2 OF 2 SHEETS

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# APPENDIX H

## Environmental Site Assessment Questionnaires (2)

APPENDIX H

Project Name: Spotorno Property
Project No. P2014.001.862

ENGEO
Expect Excellence


☒ 2010 Crow Canyon Place • Suite 250 • San Ramon, CA 94583 (925) 866-9000 • Fax (888) 279-2698
☐ 2213 Plaza Drive • Rocklin, CA 95765 (916) 786-8883 • Fax (888) 279-2698
☐ 332 Pine Street • Suite 300 • San Francisco, CA 94104 (415) 284-9900 • Fax (888) 279-2698
☐ 6399 San Ignacio Avenue • Suite 150 • San Jose, CA 95119 (408) 574-4900 • Fax (888) 279-2698
☐ 580 N. Wilma Avenue• Suite A • Ripon, CA 95366 (209) 835-0610 • Fax (888) 279-2698
☐ 17675 Sierra Highway • Santa Clarita, CA 91351 (661) 257-4004 • Fax (888) 279-2698
☐ 13211 Pusan Way • Suite 16 • Irvine, CA 92618 (949) 529-3479 • Fax (888) 279-2698


## ENVIRONMENTAL SITE ASSESSMENT QUESTIONNAIRE FOR "KEY SITE MANAGER"

To evaluate the potential for possible environmentally related impacts and site contamination the following information is requested. This questionnaire is to be preferably completed by the current property owner, or owner representative, leasing agent, or other person having good knowledge of the uses and physical characteristics of the property (Key Site Manager).

### PART I

1. Property Address/Location and Assessor's Parcel Number (APN):
   1000 MINNIE ST. (P.O. BOX 487 - MAILING ADDRESS)
   PLEASANTON, CA 94566
   APN: 949-16-6
2. Current property owner (name, address, voice/fax number):
   AVS RANCH L.L.C.
   ALEX V. SPOTORNO, MANAGER
   P.O. BOX 487 PLEASANTON, CA 94566
   925-846-2396
3. Date current property owner assumed title of property:
   PROPERTY HAS BEEN IN SPOTORNO FAMILY SINCE 1867 AND THIS PARCEL SINCE 1905. EACH GENERATION HAS PASSED PROPERTY ON TO THE NEXT. WHEN MY FATHER DIED IN 1957 HE LEFT THE PROPERTY TO MY MOTHER WHO DEEDED IT TO ME OVER A PERIOD OF YEARS. I THEN DEEDED THIS PARCEL TO MYSELF AND MY 5 CHILDREN THROUGH THE ALEX V. SPOTORNO FAMILY LIMITED PARTNERSHIP IN THE 1990s, WHICH LATER WAS CONVERTED IN 2006 TO THE AVS RANCH L.L.C. OF WHICH I AM THE MANAGER.
4. Current property development/improvements:
   AGRICULTURAL USE
5. Past property use, development/improvements:
   AGRICULTURAL USE
6. Neighboring property uses:
   OTHER PARCELS I OWN: ALEX V. SPOTORNO TRUST - RESIDENTIAL APN: 948-15-2-2
   AVS RANCH L.L.C. APN: 948-15-2-1 - AGRICULTURAL
   OTHER PROPERTY OWNERS IN HAPPY VALLEY - RESIDENTIAL - SEMI-RURAL AND CITY GOLF COURSE

**PART II** - The following questions should be answered to the best of your knowledge.

| | | Yes | No |
|---|---|---|---|
| 1. | Is/has the *property* or any adjoining property used/been used for industrial purposes? | ☐ | ☒ |
| 2. | Has the *property* or any adjoining property been used as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility? | ☐ | ☒ |
| 3. | Are there currently, or have there been previously, any damaged or discarded automotive or industrial batteries, or pesticides, paints, or other chemicals in individual containers of greater than 5 gal in volume or 50 gal in the aggregate, stored on or used at the *property* or at the facility? | ☐ | ☒ |
| 4. | Has undocumented soil been brought onto the property at any time? If yes, estimated quantity is 25 cubic yards. | ☒ | ☐ |
| 5. | Has soil been brought onto the property that originated from a contaminated site or that is of an unknown origin? | ☐ | ☒ |
| 6. | Are there currently, or have there been previously, any pits, ponds, or lagoons located on the *property* in connection with waste treatment or waste disposal? | ☐ | ☒ |
| 7. | Is there currently, or has there been previously, any stained soil on the *property*? | ☐ | ☒ |
| 8. | Are there currently, or have there been previously, any registered or unregistered storage tanks (above or underground) located on the *property*? | ☐ | ☒ |
| 9. | Are there currently, or have there been previously, any vent pipes, fill pipes, or access ways indicating a fill pipe protruding from the ground on the *property* or adjacent to any structure located on the *property*? | ☐ | ☒ |
| 10. | Are there currently, or have there been previously, any flooring, drains, or walls located within the facility that are stained by substances other than water or are emitting foul odors? | ☐ | ☒ |
| 11. | Are there any domestic, irrigation or monitoring wells on the property? | ☒ | ☐ |
| 12. | If the *property* is served by a private well or non-public water system, have contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as contaminated by any government environmental/health agency? | ☐ | ☒ |
| 13. | Have you been informed of the past or current existence of *hazardous substances* or *petroleum products* or environmental violations with respect to the *property* or any facility located on the *property*? | ☐ | ☒ |
| 14. | Have there been any *environmental site assessments* of the *property* or facility that indicated the presence of *hazardous substances* or *petroleum products* on, or contamination of, the *property* or recommended further assessment of the *property*? | ☐ | ☒ |
| 15. | Have there been any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any *hazardous substance* or *petroleum products* involving the *property*? | ☐ | ☒ |
| 16. | Has there been any past agricultural use of the *property*, such as orchards or seed crop cultivation? | ☒ | ☐ |
| 17. | Have any *hazardous substances* or *petroleum products*, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the *property*? | ☐ | ☒ |
| 18. | Is there a transformer, capacitor, or any hydraulic equipment for which there are any records indicating the presence of PCBs? | ☐ | ☒ |

If a "Yes" response was provided to any of the above questions, please provide details below:

#4. WHEN CITY WAS BUILDING THE GOLF COURSE IN THE EARLY 2000s, THEY DUG A DEEP TRENCH ALONG OUR FENCELINE ON OUR PROPERTY SEVERAL HUNDRED FEET LONG WHERE THE CULVERT IS. WHEN THEY FINISHED, THEY BACK-FILLED THE TRENCH WITH DIRT FROM THE BERNAL AVE. PROPERTY. MY ESTIMATE IS ABOUT 25 CU. YARDS.

#11. THERE IS A WELL WHERE THE WINDMILL IS THAT PROVIDED WATER FOR THE LIVESTOCK.

#16. USAGE HAS ALWAYS BEEN AGRICULTURAL – CATTLE GRAZING; HAY, GRAIN, MISC. CROPS FOR FEED AND FORAGE. NOTHING INDUSTRIAL.

I certify that the information herein is true and correct to the best of my knowledge as of the date signed below.

Name (Printed/Typed): ALEX V. SPOTORNO, MANAGER, AVS RANCH L.L.C.

Signature: [signature] Date: JANUARY 8, 2015

# APPENDIX I

## Qualifications of Environmental Professional

APPENDIX I

# BRIAN FLAHERTY, CEG, CHG, REA I
## PRINCIPAL GEOLOGIST

### EDUCATION

BS, Geology, University of Massachusetts, Amherst, 1975

MS, Geology, California State University, Hayward, 1988

### EXPERIENCE

Years with ENGEO: 32
Years with Other Firms: 3

### REGISTRATIONS & CERTIFICATIONS

Certified Engineering Geologist, CA, 1256
Certified Hydrogeologist, CA, 460
Registered Environmental Assessor, CA, 923
Professional Geologist, CA, 4030

### SPECIALIZATIONS

- Environmental Assessments and Remediation
- Geologic Hazard Evaluation
- Hillside Grading
- Landslide Investigations and Repairs
- Water Wells/Hydrogeology

### AFFILIATIONS

OBA - Oakland Builders Alliance

San Francisco Housing Action Coalition

SPUR

Mr. Flaherty has more than 30 years of diverse experience in the fields of engineering geology, geologic hazard evaluation and mitigation, and hydrogeology. During that time he has also managed and completed numerous soil and ground water characterization studies, environmental assessments, and the design and implementation of soil and ground water remediation systems. During his professional career he has worked on small to large residential developments, commercial developments, industrial business parks, military base re-use projects, water storage facilities, transportation projects and educational facilities throughout California.

Mr. Flaherty's geologic project experience includes geotechnical, geologic and earthquake hazard evaluation for projects throughout the San Francisco Bay Area. His work as a geologist has included landslide hazard mapping and assessment, slope stability evaluation, structural and rock mechanic analysis of bedrock slopes, earthquake fault hazard explorations, and preparation of Geologic Hazard Abatement District (GHAD) plans of control and monitoring.

### Select Project Experience

**Phelan Loop Development—San Francisco, CA**
*Project Manager*. Mr. Flaherty provided project management and principal review for during preparation of a phase I and phase II environmental site assessment for the Phelan Loop project site is located at the site of a MUNI bus turnaround, near the intersection of Phelan Avenue and Ocean Avenue, in San Francisco, California. The Phelan Loop project site is located at the site of a MUNI bus turnaround, near the intersection of Phelan Avenue and Ocean Avenue, in San Francisco, California. The proposed housing development will create approximately 60 units of supportive housing for low-income families and transitional aged youth (TAY).

**11th Street Four Story Mixed Use Development—San Francisco, CA**
*Project Manager*. Mr. Flaherty's duties included phase one and two environmental assessment, development and implementation of a geotechnical exploration using both conventional auger drilling and cone penetration testing. ENGEO is the geotechnical and environmental consultant for a proposed multi-use building at 340-350 11th Street. T his 4-

level wood-framed residential development will include 16 townhouse units with 2-level townhouses above 2-level townhouses. The structure will be set on a concrete podium containing ground floor commercial space above one level of underground parking. Geotechnical constraints included a high water table, liquefiable soil, building constraints and environmental soil and groundwater contamination.

**Docktown Marina—Redwood City, CA**
*Project Manager*. Mr. Flaherty managed the phase II environmental assessment to identify possible recognized environmental conditions associated with past property use as a vehicle and boat maintenance areas and as a former tannery facility. The Docktown Marina study involved two land use plans under consideration; four-story over two-story podium structures located around the perimeter of the site or two four-story residential buildings wrapped around two four-story parking structures.

**1150 Ocean Avenue—San Francisco, CA**
*Project Manager*. Mr. Flaherty prepared the geotechnical exploration and a phase II environmental site assessment for this mixed use project. Site concerns include possible soil and groundwater contamination from hydraulic lifts and the impact of a high groundwater table on the planned underground parking structure. A four-level wood-framed mixed-use residential development is planned with about 150 apartment units. The structure will be set on a concrete podium with about 30,000 square feet of retail commercial space above one level of underground parking.

**Terminal One, Brickyard Cove—Richmond, CA**
*Principal in Charge*. Mr. Flaherty provided expert environmental review of the Remedial Investigation Report and the Feasibility Study including consultation with the Regional Water Control Board (RWQCB). The purpose was to evaluate the findings and recommendations of an environmental consultant's reports to determine if the property could be developed for a multi family residential use. The Terminal One property includes approximately 12 acres of Bay margin land south of Brickyard Cove Road in Point Richmond, California. The site was previously used by both public and private entities primarily for the processing, transferring, and storage of bulk liquids.

The current project development concept included a high-density residential constructions with a large, central multi-unit "podium structure" and approximately 5 smaller multi-unit podium structures totaling approximately 272 housing units.

**Redwood Road, Chevron—Oakland, CA**
*Project Manager*. Mr. Flaherty reviewed the site history and prepared a work plan for regulatory agency approval to characterize reported soil contamination beneath a former fueling station ENGEO provided environmental services to remove the former LUST designated facility from the county's list of contaminated properties

**Marina District Various PG&E Sites—San Francisco, CA**
*Project Manager*. Mr. Flaherty managed the compilation and review of historic maps and air photographs, consultants reports, and archival records to help establish the histroy of development and filling in the Marina District of San Francisco. Efforts included the

development of a fill sequence timeline in the neighborhood and a graphic video showing three dimensional views of the various sequences of fill. ENGEO undertook an extensive review of public and private documents and photographs to develop a timeline for the placement of fill in the Marina District of San Francisco

**Monarch Village - Senior Housing—Daly City, CA**
*Project Manager*. Mr. Flaherty led the geotechnical and environmental review of the site conditions during the project design phase actively working with the owner and contractor. He also oversaw the site grading providing guidance for the characterization and disposal of contaminated soils  Attached senior housing complex with construction of a three-story building over two levels of garage, two retail buildings, and related landscape and hardscape improvements with on-grade paved parking.

**Tidewater Avenue—San Francisco, CA**
*Project Manager*. Mr. Flaherty provided geotechnical and environmental consultation services to a group of industrial property owners located within the boundaries of the City of Oakland's Central Estuary Plan area. Mr. Flaherty has reviewed geotechnical engineering reports, geohazards (liquefaction analysis) reports and phase I and II environmental site assessment reports for the various property owners. He has provided input to the owners with regard to the various redevelopment plans considered by the City of Oakland and responded to requests by the owners to clarify City directives and requests made to the owners regarding access and use of their parcels by City of Oakland environmental consultants. ENGEO provided as-needed geotechnical and environmental consultation services to a group of industrial property owners located within the City of Oakland's Central Estuary Plan area.

**Ashby Arts Mixed Use Development—Berkeley, CA**
*Project Manager*. Mr. Flaherty managed and completed the project geotechnical exploration and provided environmental consultation to the design team. The Ashby Arts development consists of a five-story mixed-used podium structure. The ground level will contain retail and parking spaces while the 2nd to 5th floors will be 1-to-2 bedroom residential units along with common areas for the residents' use.

**Hunters Point Shipyard Redevelopment, 'Parcel A'—San Francisco, CA**
*Principal Geologist*. Mr. Flaherty was Principal in Charge for the geotechnical, geologic, and hydrologic design for the development of Parcel A at the Hunters Point Shipyard. He managed the production of the project geotechnical exploration report and the analysis and development of the project corrective grading plans and storm water management plan. He managed the mapping of the project bedrock and the implementation of a bedrock screening and sampling program to test for naturally-occurring asbestos in the site bedrock. The 70-acre project includes 1,800 residential units, approximately 25 acres of parks and open space, limited retail, and supporting infrastructure and roadways. Site preparation included construction of terraced soil nail walls and mechanically stabilized earth walls, geotechnical remediation of 13 landslides totaling over 500,000 cubic yards of soil, and project grading totaling nearly 1.5 million cubic yards.

# Appendix G:
# Noise Supporting Information

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# G.1 - Noise Measurement Survey Sheets

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Project Number: 2148.0015 Sheet ___of ___
Project Name: Spotorno
Test Personnel: Spencer

# Noise Measurement Survey

Site Number: ST-1 Date: 2/8/2018 Time: From 12:05 p.m To 12:20 p.m.

Site Location: 50 feet away from Westbridge Ln. at southwestern most point of site.

Primary Noise Sources: Auto traffic along Westbridge Lane, bird noise

**Measurement Results**

| | dBA |
|---|---|
| Leq | 52.6 |
| Lmax | 74.4 |
| Lmin | 37.1 |
| Lpeak | — |
| L5 | 51.1 |
| L10 | 47.4 |
| L50 | 41.0 |
| L90 | 39.1 |
| SEL | — |

**Observed Noise Sources/Events**

| Time | Noise Source/Event | dBA |
|---|---|---|
| 12:10pm | Garbage truck passing | 74.4 |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Comments:

Equipment: LXT-1 Measured Difference: -0.06 dBA
Settings: A-Weighted☑ Other☐ Slow☐ Fast☐ Windscreen☑

**Atmospheric Conditions:**

| Maximum Wind Velocity (mph) | Average Wind Velocity (mph) | Temperature (F) | Relative Humidity (%) | |
|---|---|---|---|---|
| 5.0 | 1.7 | 81.2 | | |
| | | | | |
| Comments: | Bright, sunny day; light winds. | | | |

Photos Taken:

| Photo Number | Location/Description |
|---|---|
| | |
| | |
| | |
| | |
| | |

Traffic Description:

| Roadway | # Lanes | Posted Speed | Average Speed | NB/EB Counts | SB/WB Counts |
|---|---|---|---|---|---|
| Westbridge Ln. | 2 | 20 mph | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Diagram/Further Comments:

Traffic Count

| Small | medium | Large |
|---|---|---|
| III | | I |

Project Number: 2148.0015 Sheet ___of ___
Project Name: Spotorno
Test Personnel: Spencer

# Noise Measurement Survey

Site Number: ST-2 Date: 2/8/2018 Time: From 11:17 a.m. To 11:32 a.m.

Site Location: 30 feet from Alisal Street, across from church parking lot where Alisal Street curves West.

Primary Noise Sources: Birds, auto traffic on Alisal St., leaf blowers and construction saw use in background

**Measurement Results**

| | dBA |
|---|---|
| Leq | 50.9 |
| Lmax | 65.9 |
| Lmin | 37.2 |
| Lpeak | — |
| L5 | 55.4 |
| L10 | 54.4 |
| L50 | 43.7 |
| L90 | 39.3 |
| SEL | — |

**Observed Noise Sources/Events**

| Time | Noise Source/Event | dBA |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Comments:

Equipment: LXT-1
Settings: A-Weighted☑ Other☐

Measured Difference: -0.05 dBA
Slow☐ Fast☐ Windscreen☑

**Atmospheric Conditions:**

| Maximum Wind Velocity (mph) | Average Wind Velocity (mph) | Temperature (F) | Relative Humidity (%) | |
|---|---|---|---|---|
| 3.2 | 1.4 | 80.6 | | |
| | | | | |
| Comments: | Sunny day with no clouds, minimal wind | | | |

Photos Taken:

| Photo Number | Location/Description |
|---|---|
| | |
| | |
| | |
| | |
| | |

Traffic Description:

| Roadway | # Lanes | Posted Speed | Average Speed | NB/EB Counts | SB/WB Counts |
|---|---|---|---|---|---|
| Alisal St. | 2 | 15 mph | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Diagram/Further Comments:

Traffic Count
Small
IIII

Project Number: 2148.0015 Sheet ___of ___
Project Name: Spotorno
Test Personnel: Spencer

# Noise Measurement Survey

Site Number: ST-3 Date: 2/8/2018 Time: From 11:40 a.m To 11:55 a.m.

Site Location: northwestern corner of site, 50 feet from Alisal Street.

Primary Noise Sources: Auto traffic and birds

**Measurement Results**

| | dBA |
|---|---|
| Leq | 45.5 |
| Lmax | 58.3 |
| Lmin | 37.6 |
| Lpeak | — |
| L5 | 52.0 |
| L10 | 47.3 |
| L50 | 41.7 |
| L90 | 39.4 |
| SEL | — |

**Observed Noise Sources/Events**

| Time | Noise Source/Event | dBA |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Comments:

Equipment: LXT-1
Settings: A-Weighted☑ Other☐

Measured Difference: -0.06 dBA
Slow☐ Fast☐ Windscreen☑

**Atmospheric Conditions:**

| Maximum Wind Velocity (mph) | Average Wind Velocity (mph) | Temperature (F) | Relative Humidity (%) | |
|---|---|---|---|---|
| 3.7 | 1.6 | 81.3 | | |
| | | | | |
| Comments: | | | | |

Photos Taken:

| Photo Number | Location/Description |
|---|---|
| | |
| | |
| | |
| | |
| | |

Traffic Description:

| Roadway | # Lanes | Posted Speed | Average Speed | NB/EB Counts | SB/WB Counts |
|---|---|---|---|---|---|
| Alisal Street | 2 | 15 | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Diagram/Further Comments:

Traffic Count
small
111

# G.2 - Traffic Noise Modeling

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TABLE Existing-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18100  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 87.8 | 183.6 | 392.7 |

---

TABLE Existing-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18300  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.27

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 88.4 | 184.9 | 395.6 |

---

TABLE Existing-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18000  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.20

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 87.5 | 182.9 | 391.3 |

---

TABLE Existing-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2500  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 50.4 |

---

TABLE Existing-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1100  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.74

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Existing-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 410  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.45

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Existing-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Existing

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 440  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 41.90

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Existing Plus Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18200  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.25

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 88.1 | 184.2 | 394.2 |

---

TABLE Existing Plus Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18400  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.30

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 88.7 | 185.5 | 397.0 |

---

TABLE Existing Plus Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 18100  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 66.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 87.8 | 183.6 | 392.7 |

---

TABLE Existing Plus Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2800  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 54.79

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 54.3 |

---

TABLE Existing Plus Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1300  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 51.46

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Existing Plus Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 580  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 47.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Existing Plus Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Existing Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 580  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 43.10

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term No Project-01

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24600  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.56

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 106.4 | 224.6 | 481.5 |

---

TABLE Near-term No Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24900  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.61

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 107.2 | 226.4 | 485.4 |

---

TABLE Near-term No Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22700  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.21

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 101.1 | 213.0 | 456.5 |

---

TABLE Near-term No Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3400  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 55.64

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 61.7 |

---

TABLE Near-term No Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1400  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 51.78

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term No Project-06

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 800  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 49.35

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term No Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Near-term No Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 900  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.01

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term Plus Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 24800  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.59

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 106.9 | 225.8 | 484.1 |

---

TABLE Near-term Plus Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 25000  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.63

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 107.5 | 227.0 | 486.7 |

---

TABLE Near-term Plus Project-03

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 22800  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 101.4 | 213.6 | 457.8 |

---

TABLE Near-term Plus Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3700  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.00

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 65.2 |

---

TABLE Near-term Plus Project-05

FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1600  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 52.36

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term Plus Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 920  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 49.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Near-term Plus Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Near-term Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 920  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.11

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative no Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28700  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.23

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 58.5 | 117.3 | 248.6 | 533.4 |

---

TABLE Cumulative no Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 29000  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.27

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 58.8 | 118.1 | 250.3 | 537.1 |

---

TABLE Cumulative no Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27000  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.96

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 56.5 | 112.9 | 238.7 | 512.2 |

---

TABLE Cumulative no Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 3800  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.12

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 66.4 |

---

TABLE Cumulative no Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1900  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.11

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative no Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1000  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 50.32

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative no Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Cumulative no Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1100  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 45.88

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative Plus Project-01
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Boulevard - I-680 off-ramp to Riddell Street
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 28900  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.26

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 58.7 | 117.9 | 249.7 | 535.9 |

---

TABLE Cumulative Plus Project-02
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Riddell Street to Arlington Drive
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 29100  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 68.29

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 58.9 | 118.4 | 250.8 | 538.4 |

---

TABLE Cumulative Plus Project-03
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sunol Blvd - Arlington Drive to Sycamore Road
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 27100  SPEED (MPH): 40  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 24  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 67.98

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 56.7 | 113.1 | 239.3 | 513.5 |

---

TABLE Cumulative Plus Project-04
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sunol Blvd. to Sycamore Creek Way
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 4100  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 56.45

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 69.8 |

---

TABLE Cumulative Plus Project-05
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Sycamore Road - Sycamore Creek Way to Amber Lane
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 2100  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 53.54

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative Plus Project-06
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Happy Valley Road - Alisal Street to Unnamed Road
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1200  SPEED (MPH): 25  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 51.11

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

TABLE Cumulative Plus Project-07
FHWA ROADWAY NOISE LEVEL ANALYSIS

RUN DATE: 02/21/2018
ROADWAY SEGMENT: Alisal Street - Happy Valley Road to Faith Chapel Assembly of God
NOTES: Spotorno Ranch EIR Project - Cumulative Plus Project

---

* * ASSUMPTIONS * *

AVERAGE DAILY TRAFFIC: 1200  SPEED (MPH): 15  GRADE: .5

TRAFFIC DISTRIBUTION PERCENTAGES

| | DAY | NIGHT |
|---|---|---|
| AUTOS | 88.08 | 9.34 |
| M-TRUCKS | 1.65 | 0.19 |
| H-TRUCKS | 0.66 | 0.08 |

ACTIVE HALF-WIDTH (FT): 6  SITE CHARACTERISTICS: SOFT

---

* * CALCULATED NOISE LEVELS * *

Ldn AT 50 FT FROM NEAR TRAVEL LANE CENTERLINE (dB) = 46.26

DISTANCE (FEET) FROM ROADWAY CENTERLINE TO Ldn

| 70 Ldn | 65 Ldn | 60 Ldn | 55 Ldn |
|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 |

---

# Appendix H:
# Public Services Supporting Information

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# H.1 - Service Request Letters

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FIRSTCARBON SOLUTIONS™

February 1, 2018

Ruben Torres, Fire Chief
Livermore-Pleasanton Fire Department
3560 Nevada Street
Pleasanton, CA 94566

Re: Spotorno Subdivision Environmental Impact Report (EIR)

Dear Chief Torres:

FirstCarbon Solutions is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Subdivision project on behalf of the City of Pleasanton. As part of the environmental review process, we are consulting with service providers to determine potential project impacts on their ability to deliver public services, including fire protection services.

The project would involve development of 39 single-family homes within a 31 acre portion of the 154 acre site. The proposed project is situated on an approximately 154-acre site within the southern portion of the City of Pleasanton, Alameda County, California in an area that is known as Happy Valley. The project site is located within the City Urban Growth Boundaries, and within the Happy Valley Specific Plan (HVSP) area. The Project site can be accessed via Happy Valley Road from the west portion of the Project site and from Alisal Street via Sycamore Road from the north as can be seen in the site plan provided below. The Project site is surrounded by Alisal Street (west), large parcel residential (north), open space (east), and Westbridge Lane, Faith Chapel of God, and Alisal Street (south). The closest fire stations are Livermore-Pleasanton Fire Station #1 at 3560 Nevada Street and Station#4 at 1600 Oak Vista Parkway.

An aerial view of the proposed project site and surroundings is here:
https://drive.google.com/open?id=1WTCu8Irnkr6uCMHYuUo8P_KRgGxRSmne&usp=sharing

To assist with the environmental analysis required under the California Environmental Quality Act (CEQA), would you please provide a response to the following questions by Friday February 16, 2018:

1. We have prepared the following description of the Livermore-Pleasanton Fire Department based on information posted on the Fire Department website. We would appreciate it if you could review and edit (as needed) for completeness and accuracy.

## Stations

The Fire Department operates out of ten stations, five of which are located in the City of Pleasanton. These include Station 1 on Nevada Street, Station 2 at Stoneridge Mall, Station 3 on Santa Rita Road, Station 4 on Oak Vista Way near Bernal Avenue, and Station 5 at Ruby Hill. The closest station is Station #4 located 2.12 miles away at 1600 Oak Vista Parkway.

## Staffing

How many personnel were employed by the Fire District in 2017?

## Apparatus

The Fire District maintains how many pieces of apparatus? (includes engines, aerial ladder trucks, urban search and rescue unit, hazardous materials unit, and numerous specialty teams and vehicles).

## Calls for Service and Response Times

The Fire Department responded to 12,630 calls for service in 2015. Of this figure, approximately 66 percent of the calls were for rescues and emergency medical services. Service calls were second at approximately 22 percent.

The Fire Department's average response time to emergency calls is 7 minutes.

## Emergency Medical Services

Calls for medical help represent 66% of all calls for service. These calls include medical conditions as well as traffic collisions and rescues. The LPFD has a contracted obligation with Alameda County to meet the performance measure of arriving to all medical incidents within seven minutes and thirty seconds from time of dispatch, in 90% of these calls for service. In 2015, the department met that goal responding to all medical calls within that timeframe, 91.73% of the time. Do you have the most recent data for 2016?

2. The closest Station to the project site is Station 4. How many calls did Station 4 receive in 2016? Please identify the number of calls for service that you anticipate the proposed project would generate. Please indicate if the Fire Department would have adequate resources to accommodate this number of calls for service.

3. Please describe any significant challenges the proposed project may present to the Fire Department. This includes concerns related to response times, staffing, apparatus, fire stations, etc. For any significant concerns, please describe what measures you would recommend to reduce the potential impact.

4. Please feel free to provide any additional information you believe to be relevant to the proposed project.

Thank you in advance for taking the time to respond.

Spencer Pignotti,
Environmental Analyst
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
E-mail: spignotti@fcs-intl.com

# SITE PLAN

# SPOTORNO PROPERTY - LOT 98

**CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA**

**FOR: TIM LEWIS COMMUNITIES**

RJA
RUGGERI-JENSEN-AZAR
ENGINEERS • PLANNERS • SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

DATE: NOVEMBER 8, 2017 JOB NO. 151008 SHEET 1 OF 1

C:\JOBS2015\151008\CAD FILES\00-EXHIBITS\151008-SITE PLANLING 11/8/2017 10:08:52 AM WRK MYERS

FIRSTCARBON SOLUTIONS™

February 1, 2018

Dave Spiller, Police Chief
Pleasanton Police Department
4833 Bernal Avenue
Pleasanton, CA 94566

Re: Spotorno Subdivision Environmental Impact Report (EIR)

Dear Chief Spiller:

FirstCarbon Solutions is preparing an Environmental Impact Report (EIR) for the proposed Spotorno Subdivision project on behalf of the City of Pleasanton. As part of the environmental review process, we are consulting with service providers to determine potential project impacts on their ability to deliver public services, including police protection services.

The project would involve development of 39 single-family homes within a 31 acre portion of the 154 acre site as seen in the exhibit on page 3. The proposed project is situated on an approximately 154-acre site within the southern portion of the City of Pleasanton, Alameda County, California in an area that is known as Happy Valley. The project site is located within the City Urban Growth Boundaries, and within the Happy Valley Specific Plan (HVSP) area. The Project site can be accessed via Happy Valley Road from the west portion of the Project site and from Alisal Street via Sycamore Road from the north. The Project site is surrounded by Alisal Street (west), large parcel residential (north), open space (east), and Westbridge Lane, Faith Chapel of God, and Alisal Street (south).

An aerial view of the proposed project site and surroundings is here:
https://drive.google.com/open?id=1WTCu8Irnkr6uCMHYuUo8P_KRgGxRSmne&usp=sharing

To assist with the environmental analysis required under the California Environmental Quality Act (CEQA), would you please provide a response to the following questions by Friday February 16, 2018:

1. We have prepared the following description of the Pleasanton Police Department based on information posted on the City's website. We would appreciate it if you could review and edit (as needed) for completeness and accuracy.

   ## Staffing

   The Police Department is staffed by 120 employees including both sworn and non-sworn. [Please provide most current employment value]

   ## Calls for Service

   [Please provide citywide info for 2018 or most recent year]

2. Please identify the number of calls for service that residential units generated for Pleasanton in 2017 or most recent year. Please identify the estimated number of calls for service that you anticipate the proposed project will generate on an annual basis.

3. According to the City's General Plan EIR, the goal response time for Police Services is 4 minutes for emergencies and 16 minutes for non-emergencies. Can you please confirm if the Pleasanton Police are meeting this goal or bettering it?

4. Please describe any concerns the Police Department may have about providing law enforcement services to the proposed project. This includes concerns related to response times, staffing levels, site access, etc. For any significant concerns, please describe what measures the Police Department would recommend to reduce the potential impact.

5. Please feel free to provide any additional information you believe to be relevant to the proposed projects.

Thank you in advance for taking the time to respond.

Spencer Pignotti,
Environmental Analyst
FirstCarbon Solutions
1350 Treat Boulevard, Suite 380
Walnut Creek, CA 94597
E-mail: spignotti@fcs-intl.com

# SITE PLAN

# SPOTORNO PROPERTY - LOT 98

**CITY OF PLEASANTON, ALAMEDA COUNTY, CALIFORNIA**

**FOR: TIM LEWIS COMMUNITIES**

RJA
RUGGERI-JENSEN-AZAR
ENGINEERS • PLANNERS • SURVEYORS
4690 CHABOT DRIVE, SUITE 200 PLEASANTON, CA 94588
PHONE: (925) 227-9100 FAX: (925) 227-9300

DATE: NOVEMBER 8, 2017 JOB NO. 151008 SHEET 1 OF 1

C:\JOBS2015\151008\CAD FILES\00-EXHIBITS\151008-SITE PLANLING 11/8/2017 10:08:52 AM WRK MYERS

# H.2 - Email Correspondence

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Spencer Pignotti <spignotti@fcs-intl.com>

# Spotorno Ranch Project Fire Department Service Letter

1 message

Spencer Pignotti <spignotti@fcs-intl.com> Thu, Feb 1, 2018 at 4:48 PM
To: LPFDPostmaster@lpfire.org

Hi Chief Torres,

The attached document is a service request letter asking for the Livermore-Pleasanton Fire Department's input on the potential impacts from the Spotorno Ranch project. Please let me know if you have any questions.

--
Spencer Pignotti
Environmental Services Analyst

Office +1 925.357.2562 ext.1105
Cell +1 559.892.9899

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2148.0015 Fire Letter 1.24.18.pdf
860K

Spencer Pignotti <spignotti@fcs-intl.com>

# Spotorno Ranch Project Police

1 message

Spencer Pignotti <spignotti@fcs-intl.com> Thu, Feb 1, 2018 at 4:30 PM
To: DSpiller@cityofpleasantonca.gov

Dear Chief Spiller,

The attached document is a service request letter asking for the Pleasanton Police Department's input on the potential impacts from the Spotorno Ranch project. Please let me know if you have any questions.

--
Spencer Pignotti
Environmental Services Analyst

Office +1 925.357.2562 ext.1105
Cell +1 559.892.9899

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2148.0015 police Letter 1.24.18.pdf
856K

# Appendix I:
# Spotorno Property Transportation Assessment

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Prepared by

FEHR PEERS

100 Pringle Avenue
Suite 600
Walnut Creek, CA 94596

*June 2018*

Final

# Spotorno Property

Prepared for:
City of Pleasanton
First Carbon Solutions

# Spotorno Property
# Transportation Assessment
# Final

**Prepared for:**
**City of Pleasanton**
**First Carbon Solutions**

June 28, 2018

WC17-3392

FEHR PEERS

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# EXECUTIVE SUMMARY

The report presents the analysis and findings of the Transportation Impact Assessment (TIA) for the proposed Spotorno Property (or project) development in Pleasanton, a city in Alameda County.

## PROJECT DESCRIPTION AND ANALYSIS PARAMETERS

The proposed project would develop the 154-acre Spotorno Property with 39-single family homes. The project site is located within the Happy Valley Specific Plan (HVSP) area and is generally located east of Alisal Street, south of Minnie Street, and north of Westbridge Lane. Access to the project site is proposed from a new roadway connection (Clubhouse Drive) on Alisal Street. As part of the project, a cul-de-sac would be constructed on Westbridge Lane east of Sanctuary Lane and all existing traffic on Westbridge Lane east of Sanctuary Lane would be rerouted through the project site to Alisal Street.

Project impacts on the study area roadway facilities were determined by measuring the effect project traffic would have on 8 intersections in the vicinity of the site during the weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods, and on 11 roadway segments under daily conditions. Conditions were evaluated under Existing, Near-term and Cumulative conditions, both without and with the project.

This report also evaluates construction of a bypass road that would connect Westbridge Lane to Sycamore Creek Way, shifting existing traffic and accommodating project traffic, as an alternative to the proposed project.

## FINDINGS AND RECOMMENDATIONS

### OFF-SITE INTERSECTION FINDINGS

Results of the existing conditions assessment indicate that the study intersections in the vicinity of the site generally operate at acceptable service levels during the morning and evening peak hours, with the exception of the Sunol Boulevard interchange area. The addition of project traffic is expected to slightly increase delay through the interchange area, but would not result in a significant impact based on the significance criteria in either the existing or near-term condition.

In the cumulative condition, operations of the Sunol Boulevard interchange area would continue to worsen, and the project would further exacerbate the deficiency, resulting in a significant project impact at the

northbound ramp terminal intersection based on the significance criteria. Mitigation was identified to reduce the impact to a less-than-significant level.

## OTHER FINDINGS

Other CEQA transportation considerations were reviewed; the project is expected to increase vehicular travel on roadways with sharp curves. Additionally, there could be a conflict with the *1993 Trails Master Plan* and *Happy Valley Specific Plan* as related to the provision of bicycle and pedestrian facilities through the site . Measures to lessen these potential impacts are identified in Chapter 7.

## VEHICLE MILES OF TRAVEL

An estimate of the vehicle miles of travel (VMT) generated the project on a per capita basis was prepared using the City of Pleasanton Travel Demand Model. The analysis indicates that the project would generate higher levels of VMT than the City of Pleasanton average and the Bay Area average. As neither the City of Pleasanton or Alameda CTC have significance thresholds related to VMT, this assessment was prepared for informational purposes only.

# 1.0 INTRODUCTION

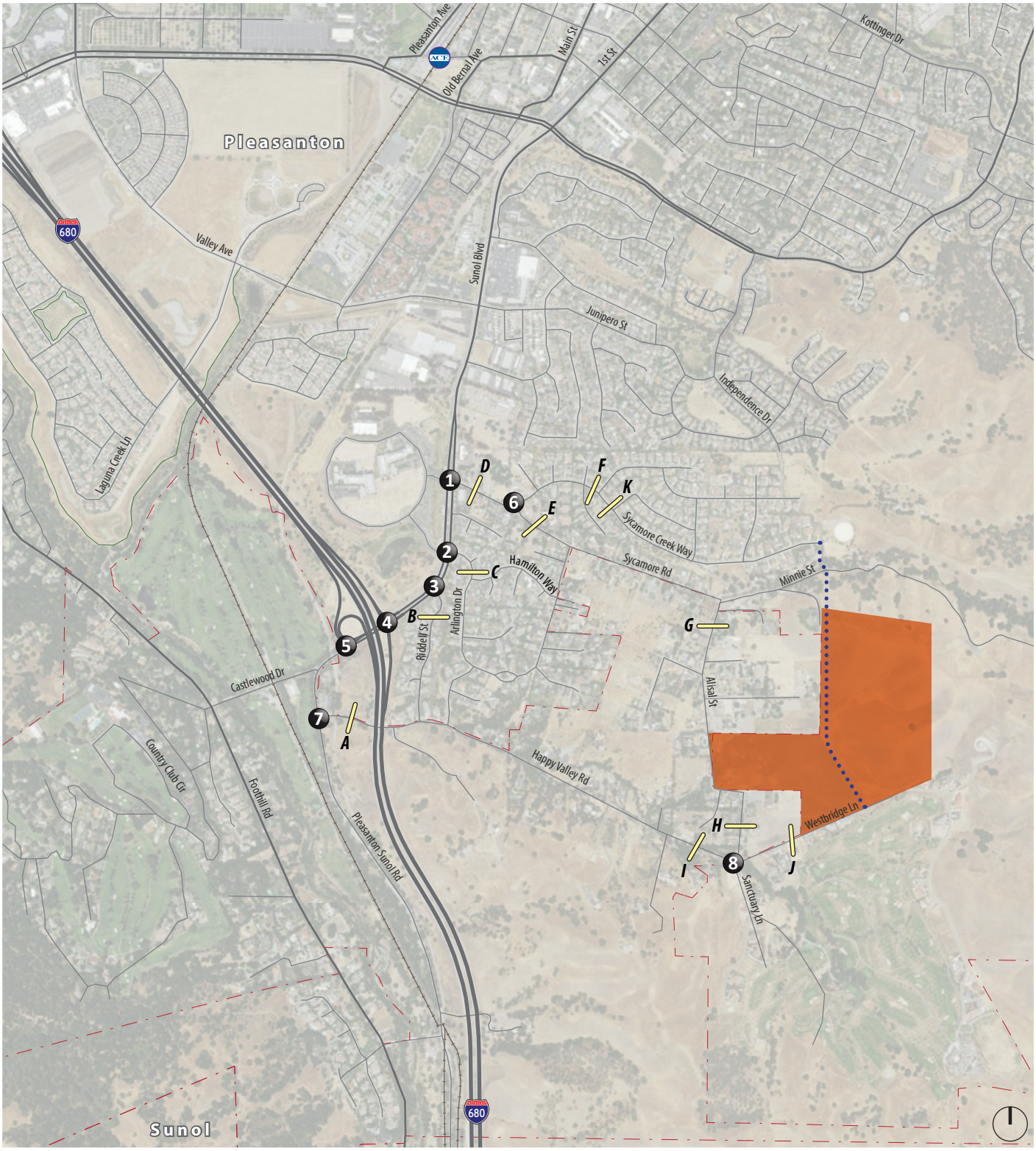
The report presents the analysis and findings of the Transportation Impact Assessment (TIA) for the proposed Spotorno Property (or project) development in Pleasanton, a city in Alameda County. The project site is located entirely within the City of Pleasanton, although some of the adjacent parcels and access roadways are located within unincorporated Alameda County. This chapter discusses the TIA purpose, analysis methods, criteria used to identify significant impacts, and report organization.

## TIA PURPOSE

The TIA's purpose is to evaluate the transportation impacts of developing the 154-acre Spotorno Property with 39-single family homes. The project site is located within the Happy Valley Specific Plan (HVSP) area and is generally located east of Alisal Street, south of Minnie Street, and north of Westbridge Lane, as shown on **Figure 1.** The parcels that comprise the Spotorno Property have varying terrain, including hills, flat areas, and a wetland area. The HVSP identifies a bypass road through the Spotorno site that would connect Westbridge Lane to Sycamore Creek Way, providing alternative access to the municipal golf course and surrounding residential uses. However, due to slopes in the area, construction of the bypass road could conflict with measure PP which prohibits the construction of structures on slopes with more than a 25 percent grade. Access to the project site is proposed from a new roadway connection (Clubhouse Drive) to Alisal Street, which would also connect to Westbridge Lane. As part of the project, a cul-de-sac would be constructed on Westbridge Lane east of Sanctuary Lane and all existing traffic on Westbridge Lane east of Sanctuary Lane would be rerouted through the project site to Alisal Street.

In summary, the project consists of the following elements, with a conceptual site plan shown on **Figure 2**:

- Construction of 39 single-family homes on a 33-acre portion of Lot 98 (designated Planned Unit Development – Rural Density Residential (PUD-RDR) District) with access from Alisal Street;
- Construction of a cul-del-sac on Westbridge Lane east of Sanctuary Lane, with all existing traffic rerouted through the project site;
- Remove the Bypass Road from the HVSP;
- Construct a trail along the north side of Westbridge Lane; and
- Dedicate the Planned Unit Development – Agriculture/Open Space (PUD-AG/OS) Districts on the undeveloped portion of the site as Open Space.




**LEGEND**

Project Site | # Study Intersection | X Study Segment | Potential Bypass Roadway

Figure 1

## Project Site Vicinity and Analysis Locations

WC17-3392_1_SiteVic

***Site Plan Source:*** Ruggeri-Jensen-Azar, Nov. 8, 2017

Figure 2

# Conceptual Project Site Plan

This study addresses the project's impacts on the roadway system under existing, near-term, and cumulative scenarios. Potential impacts to the adjacent bicycle, pedestrian, and transit network are evaluated and a vehicle miles of travel assessment was conducted.

This report also evaluates construction of a bypass road that would connect Westbridge Lane to Sycamore Creek Way, shifting existing traffic and accommodating project traffic, as an alternative to the proposed project.

## REPORT ORGANIZATION

This report is divided into eight chapters as described below:

- ***Chapter 1 – Introduction*** discusses the purpose and organization of this report.
- ***Chapter 2 – Existing Conditions*** describes the transportation system in the project vicinity, including the surrounding roadway network, peak period intersection turning movement volumes, daily roadway segment volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- ***Chapter 3 – Project Characteristics*** presents the project description, trip generation, distribution, and assignment.
- ***Chapter 4 – Existing with Project Traffic Conditions*** addresses the existing condition with the project, and discusses vehicular impacts. Conditions without and with the bypass road are considered.
- ***Chapter 5 – Near-Term Traffic Conditions*** addresses the near-term condition, both without and with the project, and discusses vehicular impacts. Conditions without and with the bypass road are considered.
- ***Chapter 6 – Cumulative Traffic Conditions*** addresses the future condition, both without and with the project, and discusses vehicular impacts. Conditions without and with the bypass road are considered.
- ***Chapter 7 – Other Considerations*** discusses site access and circulation for all travel modes, and reviews non-vehicle operations significance criteria.
- ***Chapter 8 – Vehicle Miles of Travel*** presents the results of the VMT assessment conducted for the site under existing conditions.

## STUDY LOCATIONS AND ANALYSIS SCENARIOS

Project impacts on the study area roadway facilities were identified by measuring the effect project traffic would have on intersections in the site vicinity during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak periods when commute traffic is typically the highest. The study intersections were selected in consultation with City staff based on a review of the project location and the amount of traffic that could be added to the intersections in the vicinity of the site. These intersections are shown on Figure 1 and listed below:

*Study Intersections:*

1. Sunol Boulevard at Sycamore Road
2. Sunol Boulevard at Arlington Drive
3. Sunol Boulevard at Riddell Street
4. Sunol Boulevard at Interstate 680 Northbound Ramps
5. Sunol Boulevard at Interstate 680 Southbound Ramps
6. Sycamore Creek Wat at Sycamore Road
7. Pleasanton Sunol Boulevard at Happy Valley Road
8. Happy Valley Road at Alisal Street

In addition to the evaluation of peak hour intersection operations, daily roadway segment operations were evaluated for the following segments:

A. Happy Valley Road, east of Pleasanton Sunol Boulevard
B. Riddell Street, south of Sunol Boulevard
C. Arlington Drive, south of Sunol Boulevard
D. Sycamore Creek Way, southeast of Sunol Boulevard
E. Sycamore Road, east of Sycamore Creek Way
F. Sycamore Creek Way, west of Summit Creek Lane
G. Alisal Street, south of Sycamore Road
H. Alisal Street, north of Happy Valley Road
I. Happy Valley Road, west of Alisal Street
J. Westbridge Lane, east of Alisal Street
K. Sycamore Creek Way, east of Summit Creek Lane

# SCENARIOS

Operations of the intersections above were evaluated for the following scenarios using the Transportation Research Board's (TRB) 2000 *Highway Capacity Manual* methodology using Synchro 9.0 analysis software.

1. ***Existing*** – Based on traffic counts collected 2017.
2. ***Existing Plus Project without Bypass Road*** – Existing volumes obtained from traffic counts plus traffic estimated for the Project. Roadway improvements included as part of the project are considered.
3. ***Existing Plus Project with Bypass Road*** – Existing volumes obtained from traffic counts plus traffic estimated for the Project. This scenario considers the bypass road and potential traffic shifts associated with the new roadway.
4. ***Existing Plus Approved Projects (EPAP or Near-term) No Project Conditions*** – Existing traffic plus traffic that could be generated by approved projects in the area.
5. ***EPAP Plus Project without Bypass Road*** – Traffic volumes from Scenario 4 plus traffic estimated for the Project. Roadway improvements included as part of the project are considered.
6. ***EPAP Plus Project with Bypass Road*** – Traffic volumes from Scenario 4 considering the bypass road and potential traffic shifts associated with the new roadway, plus project traffic.
7. ***Far-Term (Cumulative) No Project Conditions*** – Projected traffic volumes and the projected roadway system using the City of Pleasanton Travel Demand Model. The traffic forecasts include Approved and Pending projects, in addition to build out of land uses consistent with the General Plan and adopted Housing Element, which includes buildout of remaining non-project parcels within the Happy Valley Specific Plan area.
8. ***Far-Term (Cumulative) Project Conditions without Bypass Road*** – Traffic volumes from Scenario 7 plus traffic estimated for the Project. Roadway improvements included as part of the project are considered.
9. ***Far-Term (Cumulative) Project Conditions with Bypass Road*** – Traffic volumes from Scenario 7 considering the bypass road and potential traffic shifts associated with the new roadway, plus project traffic.

# ANALYSIS METHODS

The operations of roadway facilities are described with the term "level of service" (LOS). LOS is a qualitative description of traffic flow based on factors such as speed, travel time, delay, and freedom to maneuver. Six levels of service are defined ranging from LOS A (i.e., free flow conditions) to LOS F (over capacity conditions). LOS E corresponds to operations "at capacity." When volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F. The City of Pleasanton generally strives to maintain LOS D or better for peak hour intersection operations.

A number of intersections, referred to as Gateway and Exempted Downtown intersections, may be allowed to degrade below the level-of service D standard if no reasonable mitigation exists or if the necessary mitigation is contrary to other goals and policies of the City. For example, physical improvements at Downtown intersections to provide additional capacity for vehicles could degrade the pedestrian realm. For Gateway intersections, additional vehicle capacity could encourage additional vehicle traffic that should remain on the regional transportation system and could also degrade the pedestrian experience and visual character of the intersection.

Gateway intersections analyzed in this report include the following intersections:

- Sunol Boulevard at Interstate 680 Northbound Ramps
- Sunol Boulevard at Interstate 680 Southbound Ramps

Different methods are used to assess signalized and unsignalized (stop-controlled) intersections.

## SIGNALIZED INTERSECTIONS

Operations of signalized intersections were evaluated using the method from Chapter 16 of the Transportation Research Board's 2000 *Highway Capacity Manual,* which uses various intersection characteristics (such as traffic volumes, lane geometry, and signal phasing) to estimate the average control delay experienced by motorists traveling through an intersection. Control delay incorporates delay associated with deceleration, acceleration, stopping, and moving up in the queue. **Table 1** summarizes the relationship between average delay per vehicle and LOS for signalized intersections. This method evaluates each intersection in isolation and the effects of vehicle queue spillback are not considered in the analysis results.

**TABLE 1**
**SIGNALIZED INTERSECTION LOS CRITERIA**

| Level of Service | Description | Delay in Seconds |
|---|---|---|
| A | Progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay. | < 10.0 |
| B | Progression is good, cycle lengths are short, or both. More vehicles stop than with LOS A, causing higher levels of average delay. | > 10.0 to 20.0 |
| C | Higher congestion may result from fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level, though many still pass through the intersection without stopping. | > 20.0 to 35.0 |
| D | The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity (V/C) ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable. | > 35.0 to 55.0 |
| E | This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. | > 55.0 to 80.0 |
| F | This level is considered unacceptable with oversaturation, which is when arrival flow rates exceed the capacity of the intersection. This level may also occur at high V/C ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be contributing factors to such delay levels. | > 80.0 |

Source: 2000 *Highway Capacity Manual*.

## UNSIGNALIZED INTERSECTIONS

Operations at unsignalized intersections were evaluated using the method from Chapter 17 of the 2000 *Highway Capacity Manual*. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. Average delay for the entire intersection and for the movement or approach with the highest delay are reported. **Table 2** summarizes the relationship between delay and LOS for unsignalized intersections.

**TABLE 2**
**UNSIGNALIZED INTERSECTION LOS CRITERIA**

| Level of Service | Description | Delay in Seconds |
|---|---|---|
| A | Little or no delays | ≤ 10.0 |
| B | Short traffic delays | > 10.0 to 15.0 |
| C | Average traffic delays | > 15.0 to 25.0 |
| D | Long traffic delays | > 25.0 to 35.0 |
| E | Very long traffic delays | > 35.0 to 50.0 |
| F | Extreme traffic delays with intersection capacity exceeded | > 50.0 |

Source: 2000 *Highway Capacity Manual.*

### VEHICLE MILES OF TRAVEL

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) is updating California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with final guidelines published in November 2017 that incorporate public comments from the August 2014 and January 2016 guidelines. New guidelines are undergoing a formal rule-making process that is expected to conclude within six months of November 2017; full compliance with the guidelines is expected by 2020. In response to the final guidelines, a preliminary assessment of vehicle miles of travel (VMT) generated by the proposed project was prepared for informational purposes only.

## SIGNIFICANCE CRITERIA

The determination of significance for project impacts is based on applicable policies, regulations, goals, and guidelines defined by the City of Pleasanton, Alameda CTC and Caltrans.

The impacts of the project were evaluated by comparing the results of the level of service calculations under Existing with Project, Near-term with Project, and Cumulative with Project conditions to the results under Existing, Near-term without Project, and Cumulative without Project conditions, respectively. The detailed impact criteria for this study are presented below.

## ROADWAY OPERATIONS

The following criteria were used to identify significant off-site intersection impacts of the proposed project. Off-site intersection impacts could be considered if the Project would results in any of the following:

- Deterioration of a signalized intersection from LOS D (or better) to LOS E or LOS F[1]
- At an intersection projected to operate at LOS E or F prior to the addition of project traffic, the Project adds 10 or more trips
- Deterioration of a controlled movement at an unsignalized intersection from LOS E or better to LOS F, or at intersections where a controlled movement already operates at LOS F, one of the following:

    1. Project traffic results in satisfaction of the peak hour volume traffic signal warrant;

    2. Project traffic increases minor movement delay by more than 30 seconds; or

    3. Where the peak hour volume signal warrant is met without Project traffic and delay cannot be measured, Project increases traffic by 10 or more vehicles per lane on the controlled approach.

- The Project would 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[2] for designated roads and highways:

    1. Exceed, either individually or cumulatively, an LOS standard established by the Alameda County Transportation Commission (Alameda CTC) for designated roads or highways; or

    2. For a roadway segment of the Metropolitan Transportation System (MTS) network, the project would cause (a) the LOS to degrade from LOS E or better to LOS F or (b) the V/C ratio to increase 0.03 or more for a roadway segment that would operate at LOS F without the project.

- The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on streets in Pleasanton.

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[1] There is no level of service standard for Gateway and Downtown intersections.

[2] A separate analysis of regional roadways is required to comply with requirements of the Alameda County Transportation Commission (Alameda CTC). The Alameda CTC requires the analysis of project impacts to Metropolitan Transportation System (MTS) roadways identified in the congestion management plan (CMP) for development projects that would generate more than 100 PM peak hour trips. As shown in Table 5, the proposed project is not expected to generate more than 100 PM peak hour trips at buildout. Therefore, no CMP analysis was conducted.

## PEDESTRIAN AND BICYCLE IMPACT CRITERIA

The *City of Pleasanton 2005-2025 General Plan* and *2018 City of Pleasanton Pedestrian and Bicycle Master Plan,* describes related policies necessary to ensure that pedestrian and bicycle facilities are safe and effective for City residents. Using these plans as a guide, significant impacts to these facilities would occur when a project or an element of the project:

- Creates a hazardous condition that currently does not exist for pedestrians and bicyclists, or otherwise interferes with pedestrian accessibility to the site and adjoining areas; or
- Conflicts with an existing or planned pedestrian or bicycle facility; or
- Conflicts with policies related to bicycle and pedestrian activity adopted by the City of Pleasanton, including the Complete Streets Policy.

Other planning documents that were reviewed include the *Happy Valley Specific Plan,* the *1993 Trails Master Plan* and the February 2018 *Working Draft of the Pleasanton Trails Master Plan*.

## TRANSIT IMPACT CRITERIA

Generally, a project causes a significant impact to transit facilities and services if an element of it conflicts with existing or planned transit services. The evaluation of transit facilities shall consider if:

- A project creates demand for public transit services above the capacity which is provided, or planned;
- A project or project-related mitigation disrupts existing transit services or facilities;[3]
- A project or project-related mitigation conflicts with an existing or planned transit facility; or
- A project or project-related mitigation conflicts with transit policies adopted by the City of Pleasanton, Alameda CTC, Wheels (LAVTA), or BART for their respective facilities in the study area.

## OTHER CEQA CONSIDERATIONS

Based on Appendix G of the CEQA guidelines, other CEQA criteria were also assessed:

- Would the Project 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?
- Would the Project substantially increase traffic hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?
- Would the project result in inadequate emergency access?
- Would the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

[3] This includes disruptions caused by proposed-project driveways on transit streets and impacts to transit stops/shelters; and impacts to transit operations from traffic improvements proposed or resulting from a project.

# 2.0 EXISTING CONDITIONS

This chapter describes the existing transportation conditions in the study area, including the roadway network, and transit, pedestrian, and bicycle facilities in the vicinity of the project site.

## ROADWAY SYSTEM

The project area is located on the east side of Interstate 680 (I-680), with regional access to the site provided from an interchange with I-680 at Sunol Boulevard. Local access is provided by Sycamore Road, Happy Valley Road, and Alisal Street. These roadways as well as other key roadways in the study area are described below.

***I-680*** is a north/south designated scenic highway that connects San Jose to I-80 near Fairfield. This facility is located west of the project site and is accessible to the project via the Sunol Boulevard interchange. Three travel lanes per direction are provided through Pleasanton and based on Caltrans data, the facility carries approximately 125,000 to 130,000 vehicles per day in the vicinity of Sunol Boulevard. I-680 is designated as a Truck Route in the *City of Pleasanton 2005-2025 General Plan*.

***Sunol Boulevard*** is a southwest-northeast arterial that provides access to residential collector and local streets within the study area. Sunol Boulevard provides one travel lane in each direction through the I-680 interchange, three travel lanes in each direction east of the I-680 interchange and two travel lanes in each direction between Sycamore Road and Bernal Avenue. The posted speed limit on the section east of I-680 is 40 miles per hour (MPH). West of I-680, Sunol Boulevard continues as Pleasanton Sunol Road. No on-street parking is permitted on Sunol Boulevard. Collector roadways that connect to Sunol Boulevard in the study area include Sycamore Road and Happy Valley Road. Local streets that connect with Sunol Boulevard include Riddell Street, Arlington Drive, and Diamond Court. Sunol Boulevard is a designated truck route from the I-680 Southbound Off-Ramp intersection to State Route 84.

***Sycamore Road*** is a two-lane east-west residential collector that connects Sunol Boulevard to Sycamore Creek Way. Class II bicycle lanes are provided along Sycamore Road between Sunol Boulevard and Sycamore Creek Way, and sidewalks are provided on the north side of this segment of roadway. Sycamore Road southeast of Sycamore Creek Way does not provide pedestrian or bicycle facilities. On-street parking is permitted on some portions of the roadway and the posted speed limit is 25 mph. Speed humps have been installed at several locations along Sycamore Road.

***Sycamore Creek Way*** is a two-lane east-west residential collector that connects to Sycamore Road. Class II bicycle lanes and sidewalks are provided along its length and on-street parking is prohibited. This roadway is planned to be extended to connect with the bypass road as part of the *Happy Valley Specific Plan*.

***Arlington Drive*** is a two-lane north-south local street that connects Sunol Boulevard to other residential cul-de-sacs, and via Carriage Drive in the south provides a connection to Happy Valley Road. Sidewalks are provided on both sides of the street and on-street parking is permitted. The posted speed limit is 25 mph.

***Riddell Street*** is a two-lane north-south local street that connects Sunol Boulevard to residential cul-de-sacs and ends at Happy Valley Road. On-street parking is allowed, and the speed limit is 25 mph. To avoid congestion at the I-680 ramps, Riddell Street is commonly used as a cut-through route to access the I-680 interchange from the west side where vehicle queues are shorter. Posted turn restrictions prohibit the southbound left-turn from Sunol Boulevard to Riddell Street from 6:00 to 9:00 AM.

***Happy Valley Road*** is an east-west residential collector roadway that begins at Pleasanton Sunol Road and ends at the intersection of Alisal Street at Westbridge Lane. No pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not provided. The posted speed limit is 30 mph. Approximately 200-feet west of Pleasanton Sunol Road, a railroad undercrossing reduces the travel-way to approximately 18-feet total. Portions of Happy Valley Road, including the portion at the undercrossing, are under the jurisdiction of Alameda County.

***Westbridge Lane*** is an east-west two-lane local roadway that provides access to the Callippe Preserve Golf Course. Limited pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not allowed. As currently proposed, the project would construct a new roadway (Clubhouse Drive) that would connect Alisal Street to Westbridge Lane in combination with a cul-de-sac on Westbridge Lane east of Sanctuary Lane; except for the two existing houses located at 1340 and 1380 Happy Valley Road, all traffic would be rerouted through the project site to Alisal Street. Under analysis scenarios with the bypass road, Westbridge Lane is assumed to become a cul-de-sac, forcing all existing traffic on Westbridge Lane east of Sanctuary lane, including golf course traffic, to use the bypass road that would connect to Sycamore Creek Way.

***Alisal Street*** is a north-south residential collector that connects Sycamore Road with Happy Valley Road. As currently proposed, all access to the project site would occur from a connection to Alisal Street. No pedestrian or bicycle facilities are provided on the roadway and on-street parking is generally not provided. The posted speed limit is 25 mph.

# EXISTING PEDESTRIAN AND BICYCLE FACILITIES

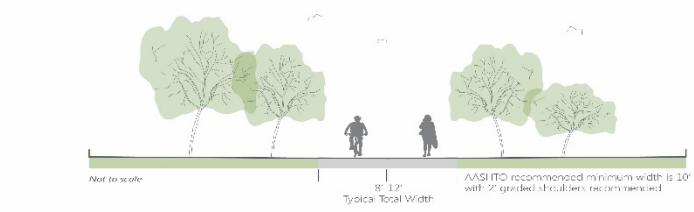
## PEDESTRIAN FACILITIES

***Pedestrian facilities*** include sidewalks, pathways, trails, crosswalks, and pedestrian signals. As noted above, sidewalks are limited on most of the existing roadway networks in the study area. Sunol Boulevard provides sidewalks on the east side of the roadway; however, this sidewalk stops at the I-680 Northbound Ramp. At the intersections of Sunol Boulevard with Sycamore Road and Arlington Drive, there are crosswalks with pedestrian call buttons. Pedestrian activity is low in the study area.

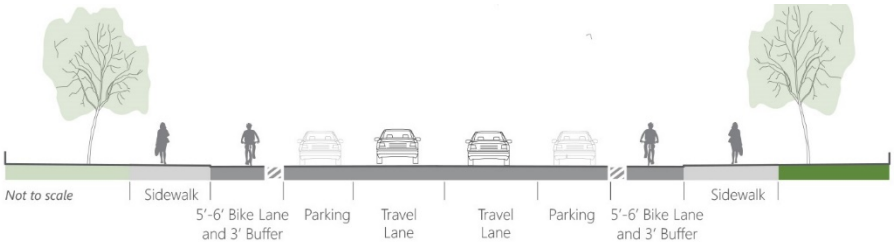
## BICYCLE FACILITIES

***Bicycle facilities*** in Pleasanton include the following general types. The graphics following the description of each type of bicycle facility are the minimum American Association of State Highway and Transportation Officials (AASHTO) standards for each type of bike facility to provide a general depiction of each type of bicycle facility. Within the City of Pleasanton, these standards provide a framework for future implementation but depending on the circumstances and where feasible, the City of Pleasanton has chosen to go above and beyond AASHTO standards.

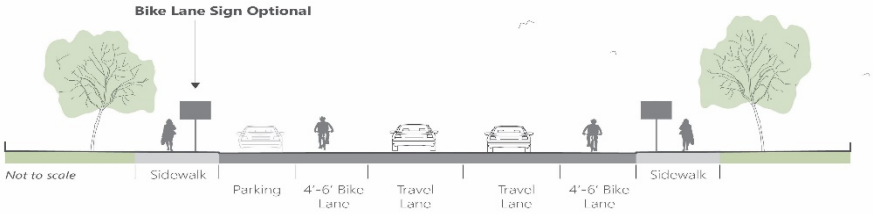
- Bike paths (Class I) – Paved trails that are separated from roadways. There are also several unpaved off-street trails within Pleasanton. These facilities are typically shared with pedestrians, although bicycles must yield to pedestrians. Vehicle cross-flow is minimized.



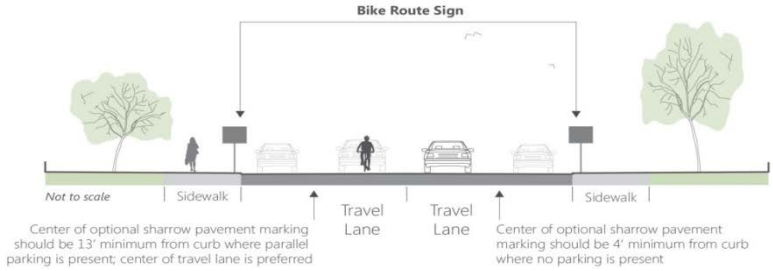

- Cycle Track/Separated Bikeways (Class IV) provides a physically separated lane for increased comfort and protection of cyclists. Can be physically separated by a barrier, such as planters or on-street parking, or grade-separated from the roadway.




- Bike lanes (Class II) provide restricted right-of-way and are designated for the use of bicycles with a striped lane on a street. Bicycle lanes are generally five (5) feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted. These facilities may also include a buffer to separate vehicle traffic from bicycle traffic, as well as to separate bicycle traffic from parked vehicles.




- Bike routes (Class III) provide for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.




- Side Paths – An off-street facility located adjacent to a roadway that is shared with pedestrians. These paths may be paved or unpaved.

There are currently Class II bicycle lanes along portions of Sunol Boulevard. In the immediate project vicinity, Class II facilities on Sunol Boulevard are only provided in the southbound direction between Sycamore Road to just west of Arlington Drive, where the lane terminates. Bicycle lanes are also provided in the vicinity of the I-680/Sunol Boulevard interchange. Class II facilities are also provided on Sycamore Road between Sunol Boulevard and Sycamore Creek Way, and along Sycamore Creek Way from Sycamore Road to its

terminus. Unpaved trails are also located in the area, including the Callippe Preserve Trail, which has a trail head on Sanctuary Lane at Happy Valley Road and on Clubhouse Drive, northeast of Westbridge Lane.

The *2018 Pedestrian and Bicycle Master Plan* identifies the provision of buffered bicycle lanes on Sunol Boulevard from Foothill Road to Bernal Avenue, and a Class I path along the transportation corridor, providing an off-street connection from south of Sunol Boulevard to Downtown Pleasanton.

The *1993 Trails Master Plan* identifies two trails within the Spotorno property area, which are further defined in the February 2018 *Working Draft of the Pleasanton Trails Master Plan*.

The *Happy Valley Specific Plan* identifies two trails within the Spotorno property area, including one that connects Alisal Street to Westbridge Lane, and a second that connects Westbridge Lane to Sycamore Creek Way.

## EXISTING TRANSIT SERVICE

Transit service in the area is provided by Wheels, Pleasanton Paratransit, The County Connection, Bay Area Rapid Transit (BART), and Altamont Commuter Express (ACE).

***Wheels*** provides fixed-route and paratransit service throughout the Cities of Dublin, Pleasanton, and Livermore, and provides connections to other transit service providers. Wheels buses connect major destinations within the Cities of Dublin, Pleasanton and Livermore, including Downtown areas, employment centers and destinations such as the Hacienda Business Park, Bernal Corporate Park, Stoneridge Mall, and transit hubs, including BART and ACE stations. Wheels bus schedules are also coordinated with ACE and BART trains during peak commute hours.

Route 8 provides the closest service to the project site and operates along Sunol Boulevard and Valley Avenue, approximately 1.5 miles from the site. Route 8 operates between East Dublin/Pleasanton BART and South Pleasanton along Hopyard and Valley, providing a connection to Downtown Pleasanton. It provides service to the Pleasanton Senior Center, Downtown Pleasanton, Kottinger Park, and Vineyard. The Route operates every 30 minutes during peak periods, and every 60 minutes midday and on weekends.

***Pleasanton Paratransit*** provides scheduled door-to-door shared ride services for residents of Pleasanton and Sunol who are age 70 and over, and for disabled residents between the ages of 18 and 69. Transportation is provided between 8:00 AM and 5:30 PM, Monday through Friday, with service also provided on Saturdays. Rides must be requested at least two days in advance.

The Central Contra Costa Transit Authority (CCCTA, ***County Connection***) provides transit service connecting destinations in Contra Costa County to the Tri-Valley area, including service from the East Pleasanton BART station to the San Ramon Transit Center and Bishop Ranch Business Park. There is also a route that connects the Walnut Creek BART station to the Downtown Pleasanton ACE station.

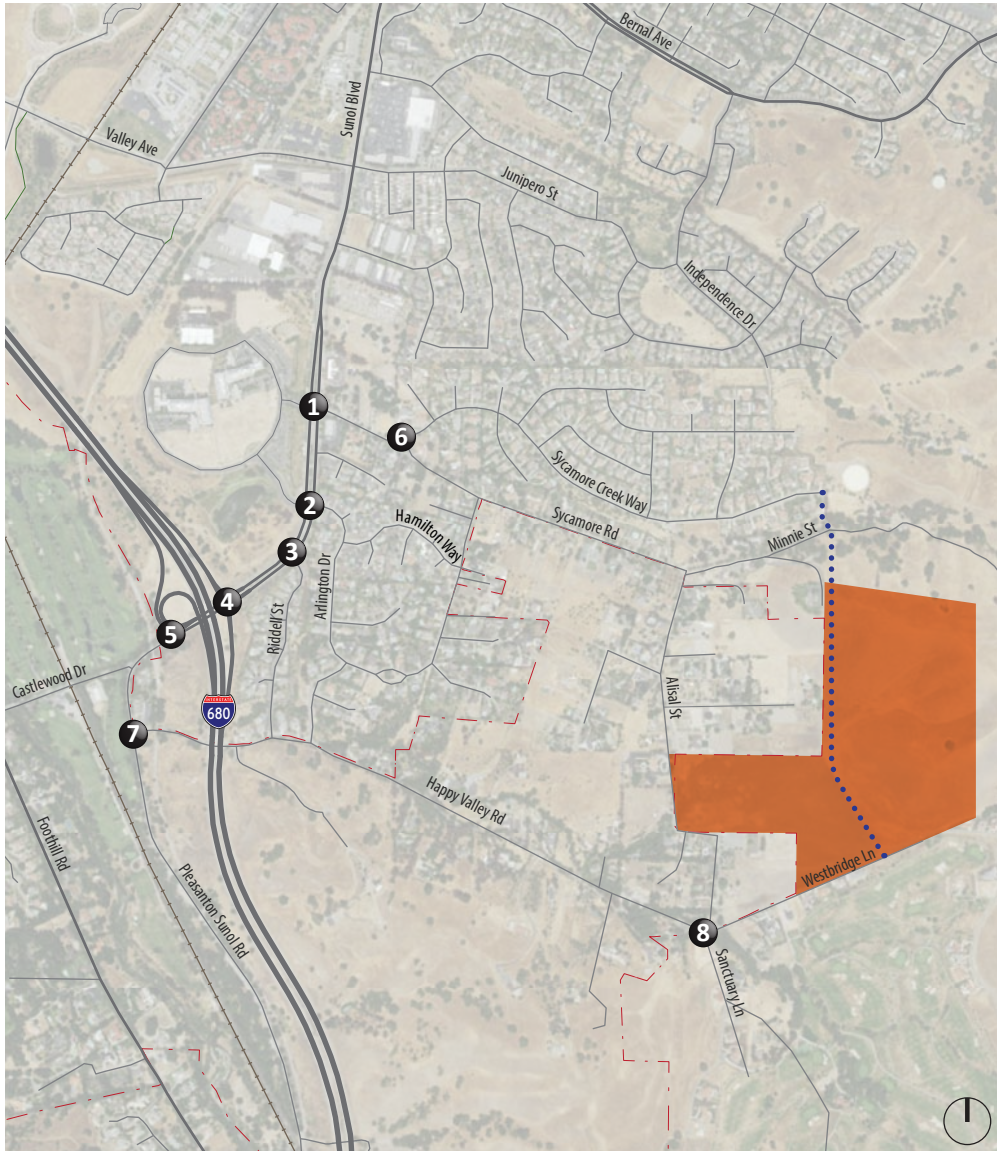
***Bay Area Rapid Transit (BART)*** provides regional transportation connections to much of the Bay Area and the Dublin/Pleasanton line provides direct access to San Francisco, with several stops in Oakland where connections may be made to other lines. BART train frequency ranges between 15-20 minutes from approximately 5:00 AM to 12:00 AM. Based on 2017 data from BART, approximately 16,000 passengers per day enter/exit the BART system at the East Dublin/Pleasanton station, and approximately 7,000 passengers enter/exit the BART system at the West Dublin/Pleasanton BART Station.

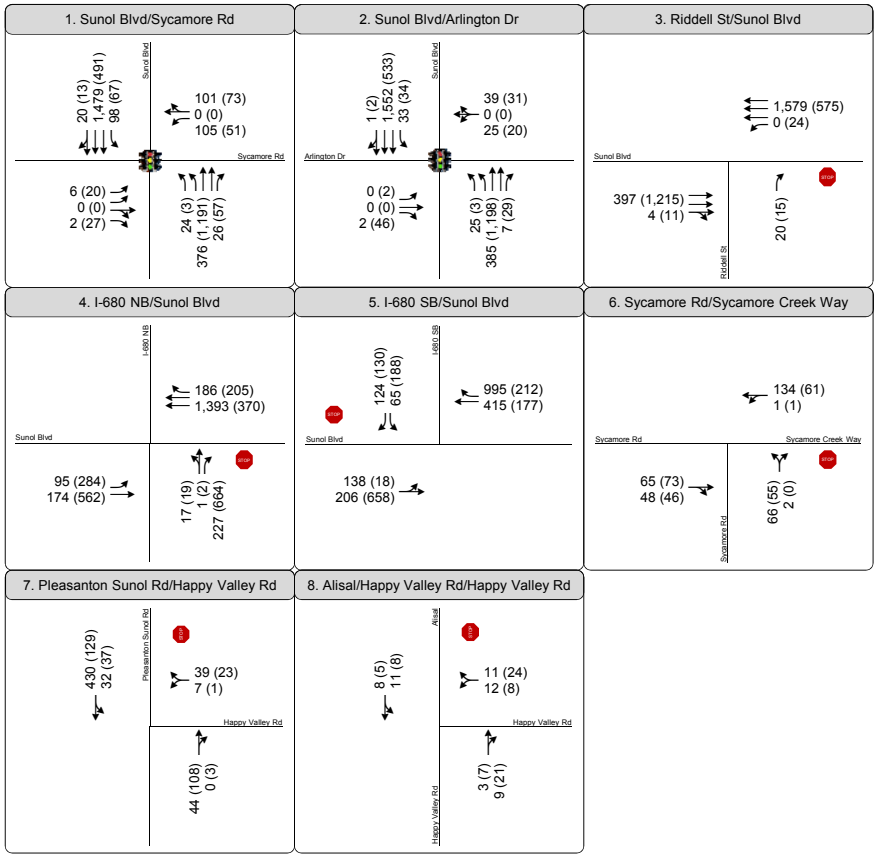
***Altamont Commuter Express*** (ACE) operates weekday train service between Stockton and San Jose with a stop in Downtown Pleasanton. During the morning commute period only westbound service from the Central Valley to San Jose is provided, while only eastbound service is provided in the afternoon/evening commute period. There are four morning trains through Pleasanton between 5:33 AM and 8:18 AM, and four evening trains between 4:28 PM and 7:31 PM. Travel time from Stockton to Pleasanton is approximately one hour and fifteen minutes, while travel time from Pleasanton to San Jose is approximately one hour. The Pleasanton ACE station is located approximately two miles northwest of the study area on Pleasanton Avenue at Bernal Avenue. Wheels provides shuttle services between the ACE stations and major employment/residential areas in Pleasanton.

Continuous pedestrian connections are not provided to transit stops from the project site, and the closest transit stop is over 1.5 miles from the project site; therefore, , it is expected that any future residents that would use transit would drive to transit stations.

## EXISTING TRAFFIC COUNTS

Weekday morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) peak period intersection turning movement counts were conducted at the study intersections March 2017 on a clear-day with area schools in normal session, including separate counts of vehicles, pedestrians and bicyclists. For the study intersections, the single hour with the highest traffic volumes during the count periods was identified. The AM peak hour in the study area is generally from 7:30 to 8:30 AM and the PM peak hour is generally from 5:00 to 6:00 PM. The peak hour volumes are presented on **Figure 3** along with the existing lane configuration and traffic control. Existing peak hour bicycle and pedestrian activity is shown on **Figure 4**. Traffic count worksheets are provided in **Appendix A**. Automatic machine traffic counts were conducted over a 72-hour period (Thursday through Saturday) on clear days in March 2017 with area schools in session.




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

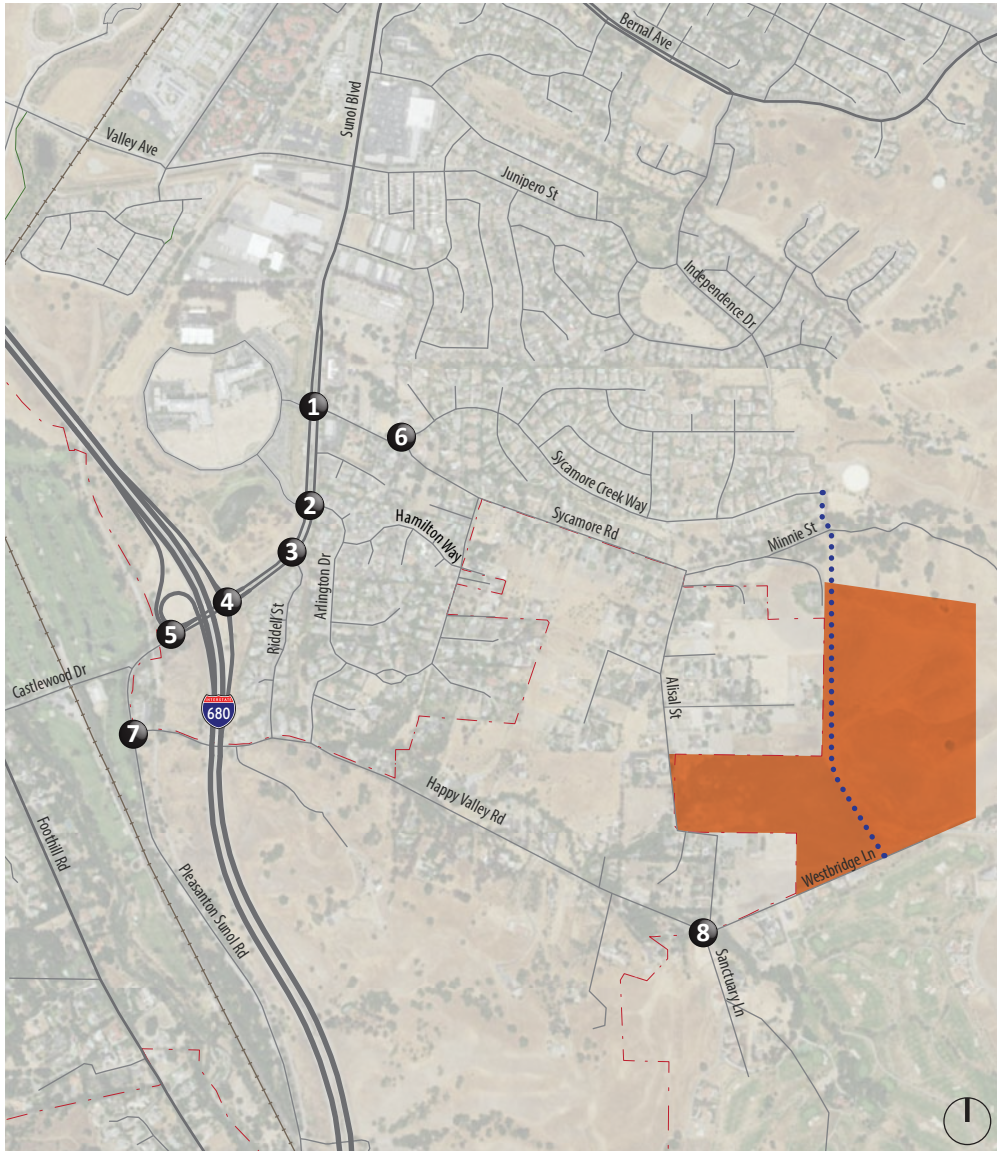
Project Site

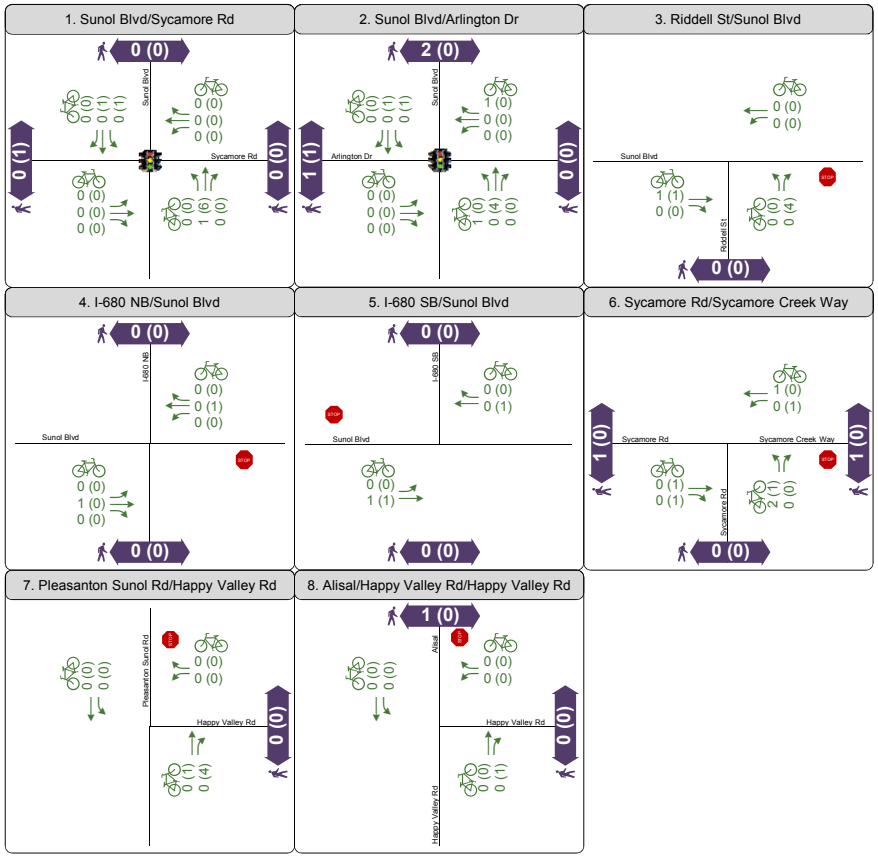
Study Intersection

Potential Bypass Roadway

Figure 3

## Existing Peak Hour
## Intersection Traffic Volumes, Lane Configurations and Traffic Controls




**LEGEND**

- x (y) — AM (PM) Peak Hour Pedestrian Volumes
- x (y) — AM (PM) Peak Hour Bicycle Volumes
- Signalized Intersection
- Stop Sign
- Project Site
- # — Study Intersection
- Potential Bypass Roadway

Figure 4

# Existing Peak Hour Bicycle and Pedestrian Volumes

Counts collected during the school year are representative of typical traffic conditions for the majority of the year; however, some historic counts collected by the City of Pleasanton indicate that during peak summer days, the golf course can generate more vehicle traffic than captured on the days of data collection. The average daily traffic volumes on these roadways are summarized below in **Table 3** and on **Figure 5**.

Traffic volumes on local streets in the area are less than 1,500 vehicles per day and volumes on residential collectors are less than 3,000 vehicles per day, with the exception of Sycamore Road between Sunol Boulevard and Sycamore Creek Way which carries approximately 3,500 vehicles per day. Weekday traffic volumes are variable, with between a 1 percent and 8 percent difference between the two weekdays of data collection, with Friday traffic volumes typically higher than Thursday. Generally, traffic volumes are lower on Saturdays than weekdays, except for some segments of Alisal Street and Happy Valley Road where Saturday levels of vehicle traffic are slightly higher than weekday levels.

**TABLE 3**
**EXISTING DAILY TRAFFIC VOLUMES**

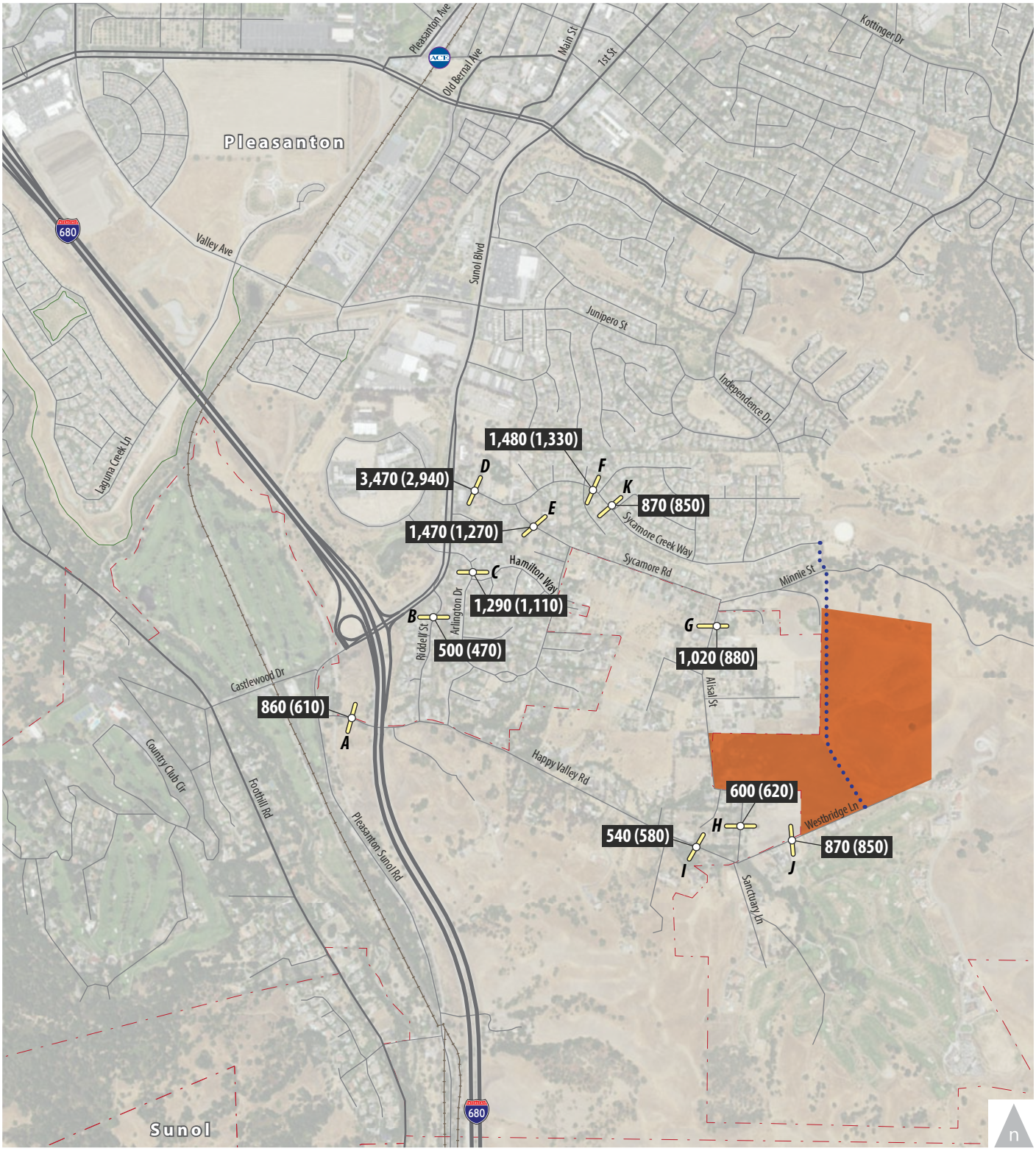
| Roadway | Roadway Classification | Average Weekday | | | Saturday | |
|---|---|---|---|---|---|---|
| | | Daily Traffic[1] | Peak Hourly Traffic[2] | Daily Fluctuation[3] | Daily Traffic | Peak Hourly Traffic |
| A. Happy Valley Road, east of Pleasanton Sunol Boulevard | Residential Collector | 860 | 90 | ±4% | 610 | 90 |
| B. Riddell Street, south of Sunol Boulevard | Local Street | 500 | 60 | ±2% | 470 | 50 |
| C. Arlington Drive, south of Sunol Boulevard | Local Street | 1,290 | 110 | ±4% | 1,110 | 110 |
| D. Sycamore Creek Way, southeast of Sunol Boulevard | Residential Collector | 3,470 | 340 | ±5% | 2,940 | 240 |
| E. Sycamore Road, east of Sycamore Creek Way | Residential Collector | 1,470 | 140 | ±6% | 1,270 | 110 |
| F. Sycamore Creek Way, west of Summit Creek Lane | Residential Collector | 1,480 | 170 | ±7% | 1,330 | 120 |
| G. Alisal Street, south of Sycamore Road | Residential Collector | 1,020 | 110 | ±8% | 880 | 90 |

**TABLE 3**
**EXISTING DAILY TRAFFIC VOLUMES**

| Roadway | Roadway Classification | Average Weekday | | | Saturday | |
|---|---|---|---|---|---|---|
| | | Daily Traffic[1] | Peak Hourly Traffic[2] | Daily Fluctuation[3] | Daily Traffic | Peak Hourly Traffic |
| H. Alisal Street, north of Happy Valley Road | Residential Collector | 600 | 80 | ±3% | 620 | 100 |
| I. Happy Valley Road, west of Alisal Street | Residential Collector | 540 | 50 | ±1% | 580 | 70 |
| J. Westbridge Lane, east of Alisal Street[4] | Local Street | 870 | 100 | ±3 | 850 | 110 |
| K. Sycamore Creek Way, east of Summit Creek Lane | Residential Collector | 870 | 100 | ±8% | 850 | 70 |

Notes:
1. Average daily two-way traffic measured over two days in March 2017.
2. Average peak hour volume from the two weekdays of data collection, rounded up to the nearest 10.
3. Percent difference between the two days of data collection.
4. Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment.

Source: Fehr & Peers, 2018.




**LEGEND**

Project Site | XX (YY) Weekday (Saturday) Existing Daily Traffic | X Study Segment | Potential Bypass Roadway

Figure 5

## Existing Daily Roadway Segment Volumes

WC17-3392_5_ExADT

# EXISTING OPERATIONS

## INTERSECTION LEVELS OF SERVICE

Existing operations were evaluated using the method described in Chapter 1 for the weekday AM and PM, peak hours at the study intersections, as summarized in **Table 4**. The analysis was based on the volumes, lane configurations and traffic control shown previously on Figure 3. Observed peak hour factors[4] were used at all intersections for the existing analysis, and pedestrian and bicycle activity was considered in the analysis.

As shown, study intersections generally operate at acceptable service levels in accordance with benchmarks set by the City of Pleasanton. During the AM peak hour, the study intersections operate at LOS C or better. During the PM peak hour, the study intersections operate at LOS D or better. However, morning peak hour operation at the Sunol Boulevard/I-680 interchange is worse than presented here due to the effects of freeway congestion that result in vehicle queue spillback from the southbound on-ramp. Additionally, vehicles waiting to turn left from either the northbound or southbound ramp to Sunol Boulevard can experience poor operations. Detailed intersection LOS calculation worksheets are presented in **Appendix B**.

## SIGNAL WARRANTS

Peak hour traffic signal warrants were reviewed at the unsignalized study intersections. Peak hour warrants[5] are met at the following unsignalized study intersection based on existing traffic volumes:

- Sunol Boulevard at I-680 Southbound Ramps

[4] The relationship between the peak 15-minute flow rate and the full hourly volume is given by the peak-hour factor (PHF) as shown in the following equation: PHF=Hourly volume/(4* volume during the peak 15 minutes of flow). The analysis of level of service is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour.

[5] Unsignalized intersection warrant analysis is intended to examine the general correlation between existing conditions and the need to install new traffic signals. Existing peak-hour volumes are compared against a subset of the standard traffic signal warrants recommended in the Manual on Uniform Traffic Control Devices (MUTCD) and associated State guidelines. This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated based on field-measured traffic data and a thorough study of traffic and roadway conditions by an experienced engineer. Furthermore, the decision to install a signal should not be based solely on the warrants because the installation of signals can lead to certain types of collisions. The responsible State or local agency should undertake regular monitoring of actual traffic conditions and accident data and conduct a timely re-evaluation of the full set of warrants in order to prioritize and program intersections for signalization.

**TABLE 4**
**EXISTING CONDITIONS**
**PEAK HOUR INTERSECTION LEVELS OF SERVICE**

| Intersection | Control[1] | Peak Hour | Existing Conditions | |
|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 12<br>13 | B<br>B |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 8<br>9 | A<br>A |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (10)<br>0 (14) | A (A)<br>A (B) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 (21)<br>5 **(62)** | A (C)<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | 2 (26)<br>6 **(38)** | A (D)<br>A **(E)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (10) | A (B)<br>A (A) |
| 7. Pleasanton Sunol Boulevard at Happy Valley Road | SSSC | AM<br>PM | 1 (9)<br>2 (9) | A (A)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) |

Notes: 1. SSSC = side-street stop controlled intersection; Signal = signalized intersection.
2. Average intersection delay calculated for signalized intersections using the *2000 HCM* method.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.
4. Morning peak hour operation at the Sunol Boulevard/I-680 interchange is worse than presented here due to the effects of freeway congestion that result in vehicle queue spillback from the southbound on-ramp.

Source: Fehr & Peers, 2018.

This chapter provides an overview of the proposed project components and addresses the proposed project trip generation, distribution, and assignment characteristics, allowing for an evaluation of project impacts on the surrounding roadway network. The amount of traffic associated with the project was estimated using a three-step process:

1. **Trip Generation** – The *amount* of vehicle traffic that would be generated by the site was estimated.
2. **Trip Distribution** – The *direction* trips would use to approach and depart the area was projected.
3. **Trip Assignment** – Trips were then *assigned* to specific roadway segments and intersection turning movements.

## PROJECT DESCRIPTION

The project site is located within the Happy Valley Specific Plan (HVSP) area and is generally located east of Alisal Street, south of Minnie Street, and north of Westbridge Lane. The parcels that comprise the Spotorno Property have varying terrain, including hills, flat areas, and a wetland area. The HVSP identifies a bypass road through the Spotorno site that would connect Westbridge Lane to Sycamore Creek Way, providing alternative access to the municipal golf course and surrounding residential uses. However, due to slopes in the area, construction of the bypass road could conflict with measure PP which prohibits the construction of structures on slopes with more than a 25 percent grade.

Access to the project site is proposed from a new roadway connection (Clubhouse Drive) to Alisal Street, which would also connect to Westbridge Lane. As part of the project, a cul-de-sac would be constructed on Westbridge Lane east of Sanctuary Lane and all existing traffic on Westbridge Lane east of Sanctuary Lane would be rerouted through the project site to Alisal Street.

In summary, the project consists of the following elements:

- Construction of 39 single-family homes on a 33-acre portion of Lot 98 (designated Planned Unit Development – Rural Density Residential (PUD-RDR) District) with access from Alisal Street;
- Construction of a cul-del-sac on Westbridge Lane east of Sanctuary Lane, with all existing traffic rerouted through the project site;
- Remove the Bypass Road from the HVSP;
- Construct a trail along the north side of Westbridge Lane; and

- Dedicate the Planned Unit Development – Agriculture/Open Space (PUD-AG/OS) Districts on the undeveloped portion of the site as Open Space.

Although the bypass road is proposed to be removed from the HVSP, this assessment considers the impacts of the project as proposed, as well as with construction of the bypass road.

## PROJECT TRIP GENERATION

Trip generation refers to the process of estimating the amount of vehicular traffic a project would add to the surrounding roadway system. Estimates are created for the daily condition and for the peak one-hour period during the morning and evening commute when traffic volumes on the adjacent streets are typically the highest. Daily estimates were also developed for Saturday. Project trip generation was estimated using rates from the Institute of Transportation Engineers (ITE) *Trip Generation Manual* (10th Edition) for single-family homes as presented in **Table 5**. The project is expected to generate up to 370 weekday and 390 Saturday daily trips, including 30 weekday morning peak hour and 40 weekday evening peak hour trips.

**TABLE 5**
**PROJECT TRIP GENERATION ESTIMATES**

| Use | Size | Saturday Daily | Weekday | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Daily | AM Peak Hour | | | PM Peak Hour | | |
| | | | | In | Out | Total | In | Out | Total |
| Single Family Homes[1] | 39 dwelling units | 390 | 370 | 7 | 22 | 29 | 25 | 14 | 39 |

1. ITE land use category 210 – Single-Family Homes (Adj Streets, 7-9A, 4-6P):
   Saturday Daily Rate: (T) =10.08 (X)
   Weekday Daily: (T) = 9.44 (X)
   AM Peak Hour: T = 0.74(X); Enter = 25%; Exit = 75%
   PM Peak Hour: T = 0.99 (X); Enter = 63%; Exit = 37%

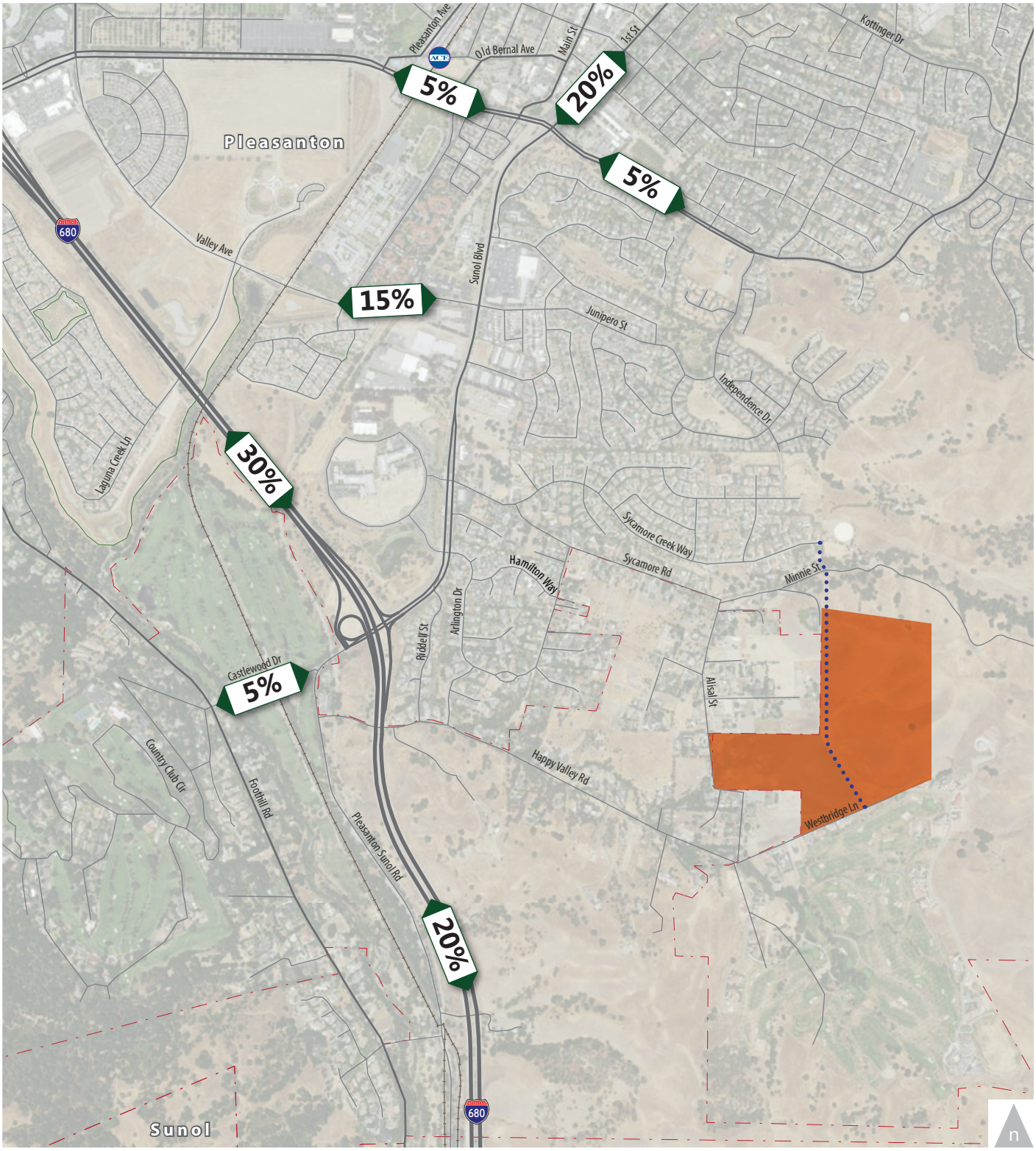
Source: *Trip Generation Manual* (10th Edition), ITE, 2017; Fehr & Peers, 2018.

# PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

Based on the location of the project area, existing traffic patterns, location of complementary land uses, and a select zone analysis using the City of Pleasanton travel demand model, trip distribution percentages were developed as depicted on **Figure 6.**

Project trips were assigned to the roadway network based on the general directions of approach and departure shown on Figure 6, but the route that people take to the site could vary. For example, a driver with a destination on I-680 southbound could travel via Happy Valley Lane or via Sycamore Road to the Sunol Boulevard interchange. The resulting project trip assignment and project-related intersection volumes are shown on **Figure 7** without the bypass road and **Figure 8** with the bypass road.

For conditions without the bypass road, the project would provide a connection to Alisal Street and construct a cul-de-sac on Westbridge Lane at Sanctuary Lane. All existing traffic that uses Westbridge Lane east of Sanctuary Lane would be rerouted through the site. For conditions with the bypass road, a cul-de-sac would be constructed on Westbridge Lane at Sanctuary Lane and all project access would occur from Westbridge Lane via the bypass road. For the purposes of this analysis, it is assumed that the bypass road would connect Westbridge Lane to Sycamore Creek Way and no westerly connection to Minnie Street would be provided from the bypass road.



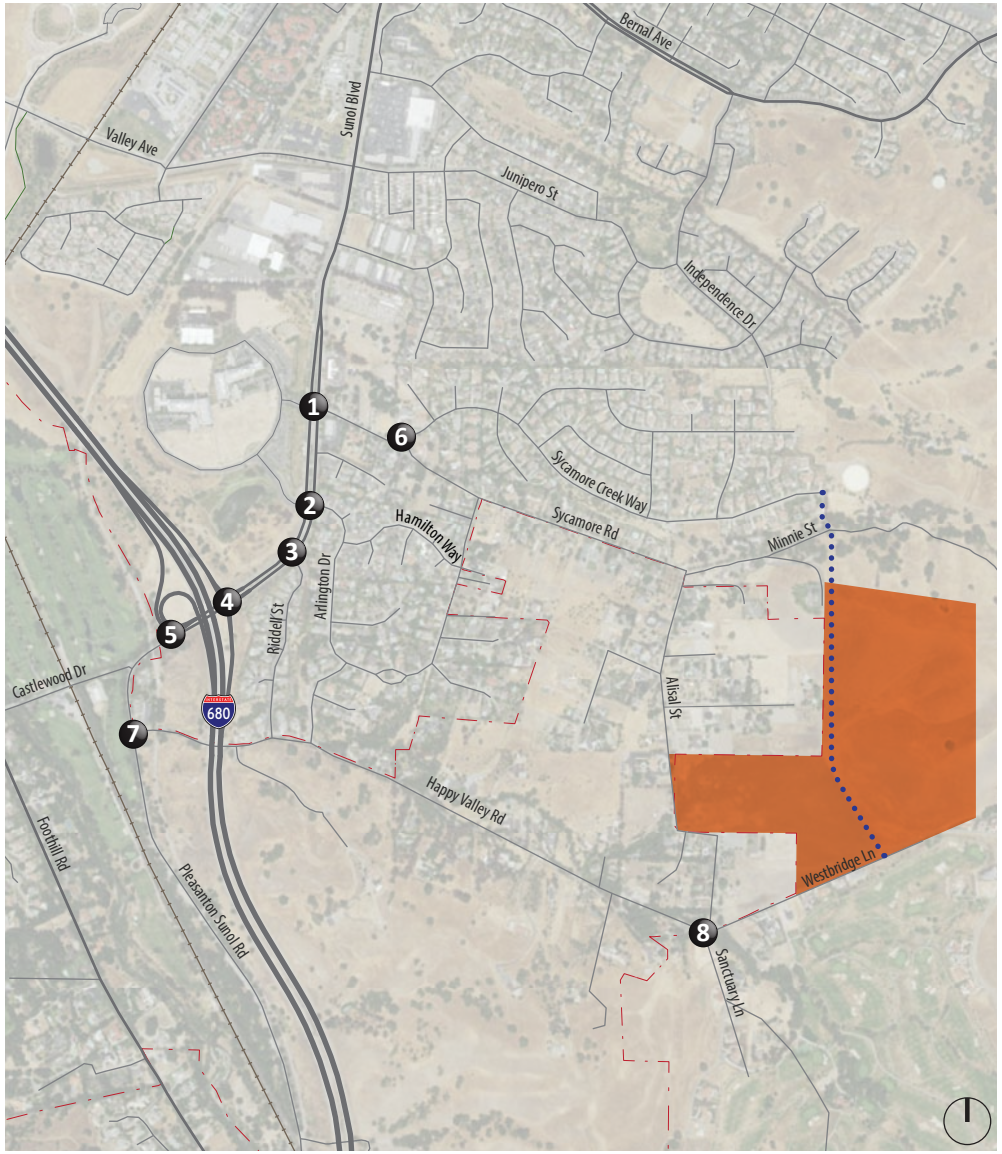

**LEGEND**

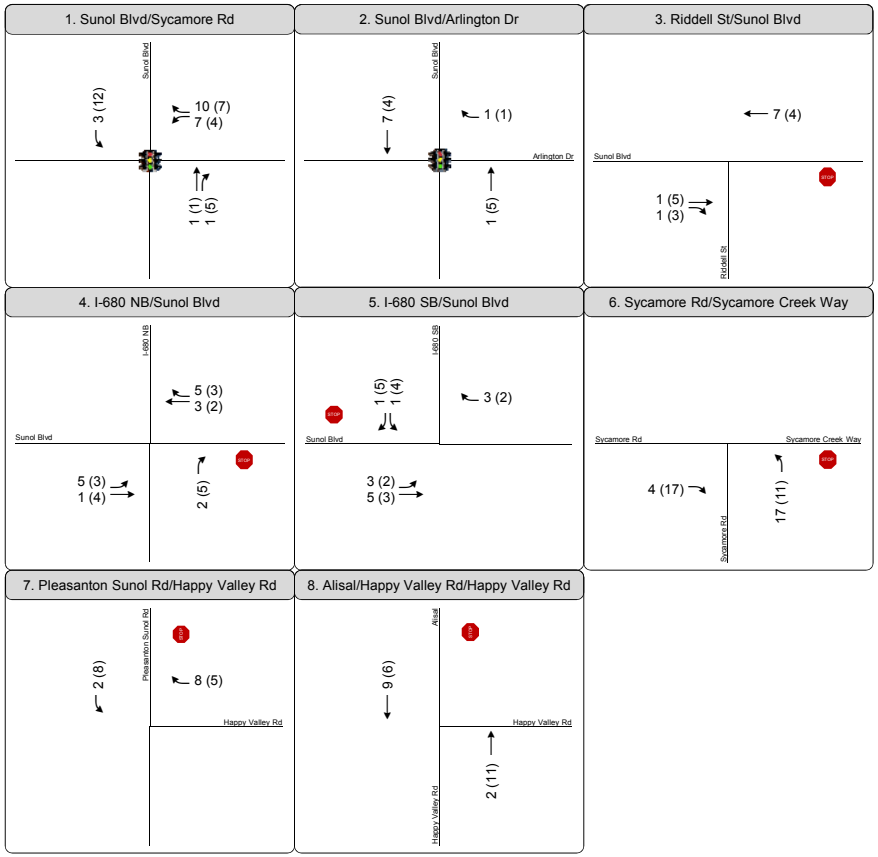
Project Site | XX% Project Trip Distribution | Potential Bypass Roadway

Figure 6

## Project Trip Distribution

WC17-3392_6_TripDistro




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

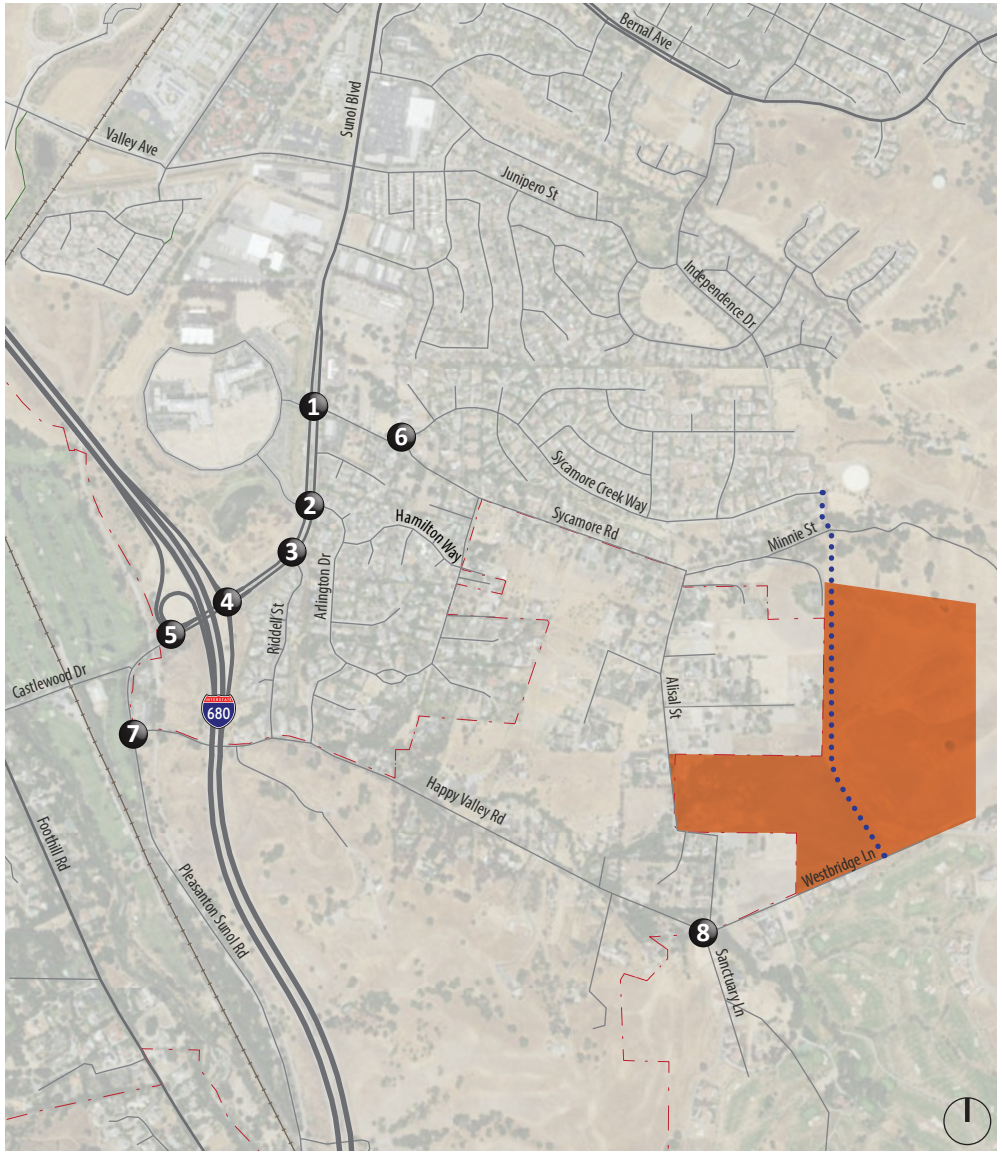
Project Site

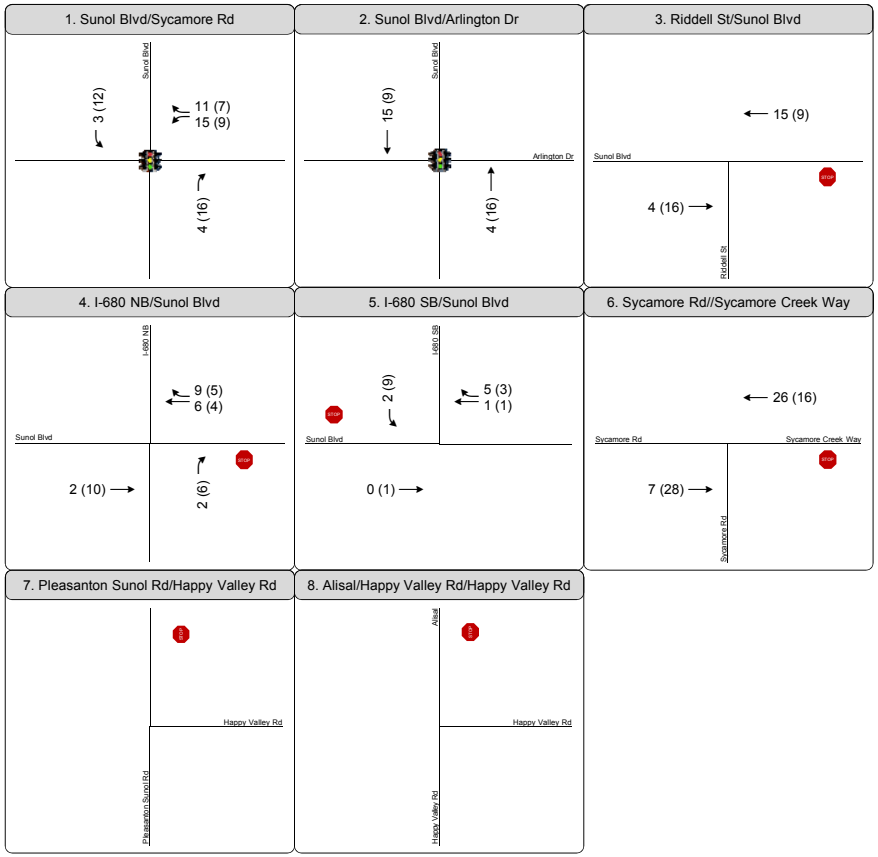
Study Intersection

Potential Bypass Roadway

Figure 7

# Project Trip Assignment without Bypass Road




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Figure 8

# Project Trip Assignment with Bypass Road

# 4.0 EXISTING WITH PROJECT CONDITIONS

This chapter evaluates potential off-site traffic impacts under Existing with Project conditions.

## EXISTING WITH PROJECT TRAFFIC VOLUMES

The project-only volumes (Figure 7) were added to the existing peak hour traffic volumes (Figure 3) to estimate the Existing with Project peak hour intersection turning movement volumes, as shown on **Figure** 9. The project would connect to Alisal Street and would close Westbridge Lane at Sanctuary Lane, rerouting all existing traffic that currently travels on Westbridge Drive east of Sanctuary Lane through the project site.

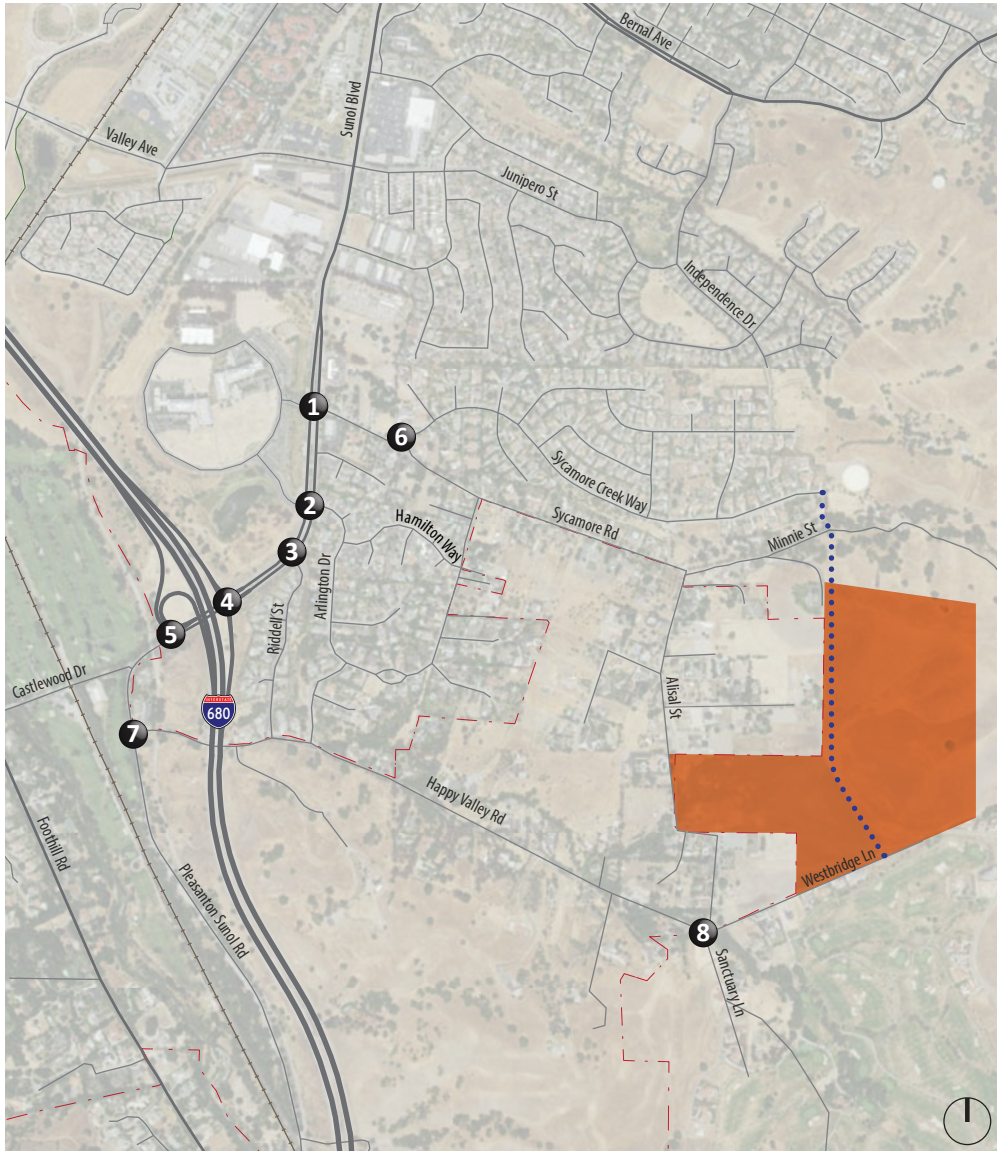
## EXISTING WITH BYPASS ROAD WITH PROJECT TRAFFIC VOLUMES

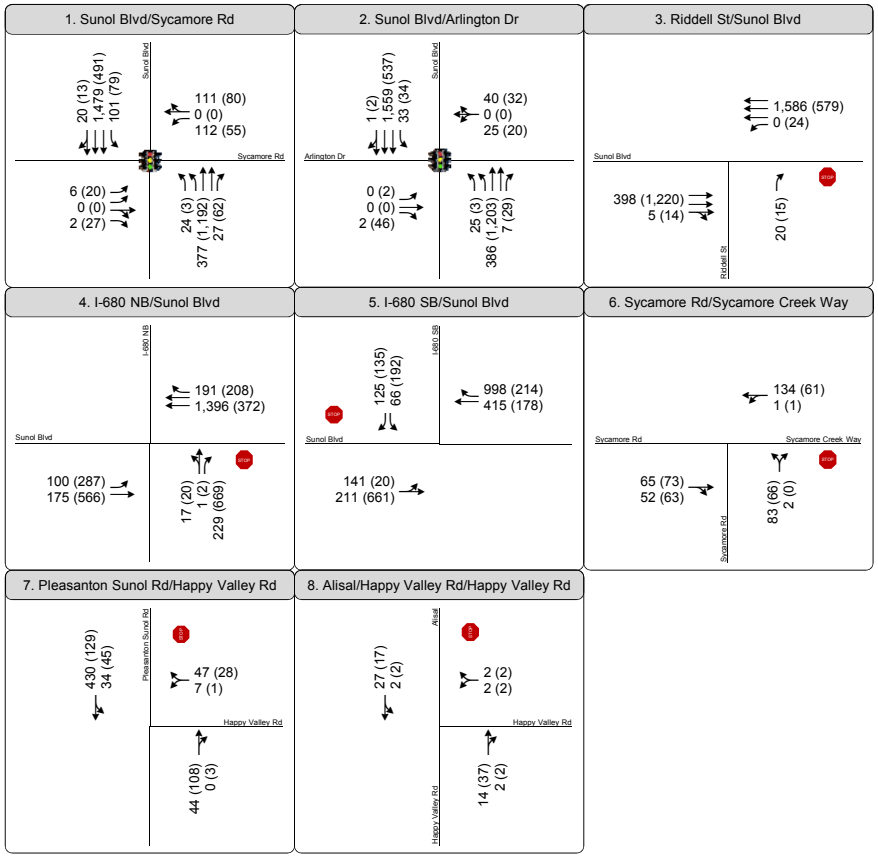
For conditions with the bypass road, it was assumed that a cul-de-sac would be constructed on Westbridge Lane at Sanctuary Lane and no access would be provided to Alisal Street. The bypass road would connect Westbridge Lane to Sycamore Creek Way; no westerly connection to Minnie Street would be provided. Existing traffic that currently travels on Westbridge Lane west of Sanctuary Lane would be rerouted to the bypass road, connecting to Sycamore Creek Way, and then to Sycamore Road. This would result in a reduction in vehicle traffic on Happy Valley Road, Alisal Street and Sycamore Road, east of Sycamore Creek Way, and an increase in vehicle traffic on Sycamore Creek Way, and Sycamore Road between Sycamore Creek Way and portions of Sunol Boulevard. Traffic volumes are projected to decrease slightly on Arlington Drive and Riddell Street. The resulting peak hour traffic volumes are presented on **Figure 10**, which considers shifts of existing traffic plus estimates of project traffic from Figure 8 with the bypass road.

## ANALYSIS OF EXISTING WITH PROJECT CONDITIONS

### INTERSECTION LEVELS OF SERVICE

Existing with Project without Bypass Road and Existing with Project with Bypass Road conditions were evaluated using the same methods described in Chapter 1. The analysis results are presented in **Table 6**, based on the traffic volumes and lane configurations presented on Figure 9 and Figure 10. Traffic signal timings, peak hour factors, and bicycle and pedestrian volumes at the intersection were assumed to remain the same as existing conditions. Table 6 also includes the operations results for the Existing without Project conditions for comparison purposes.




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

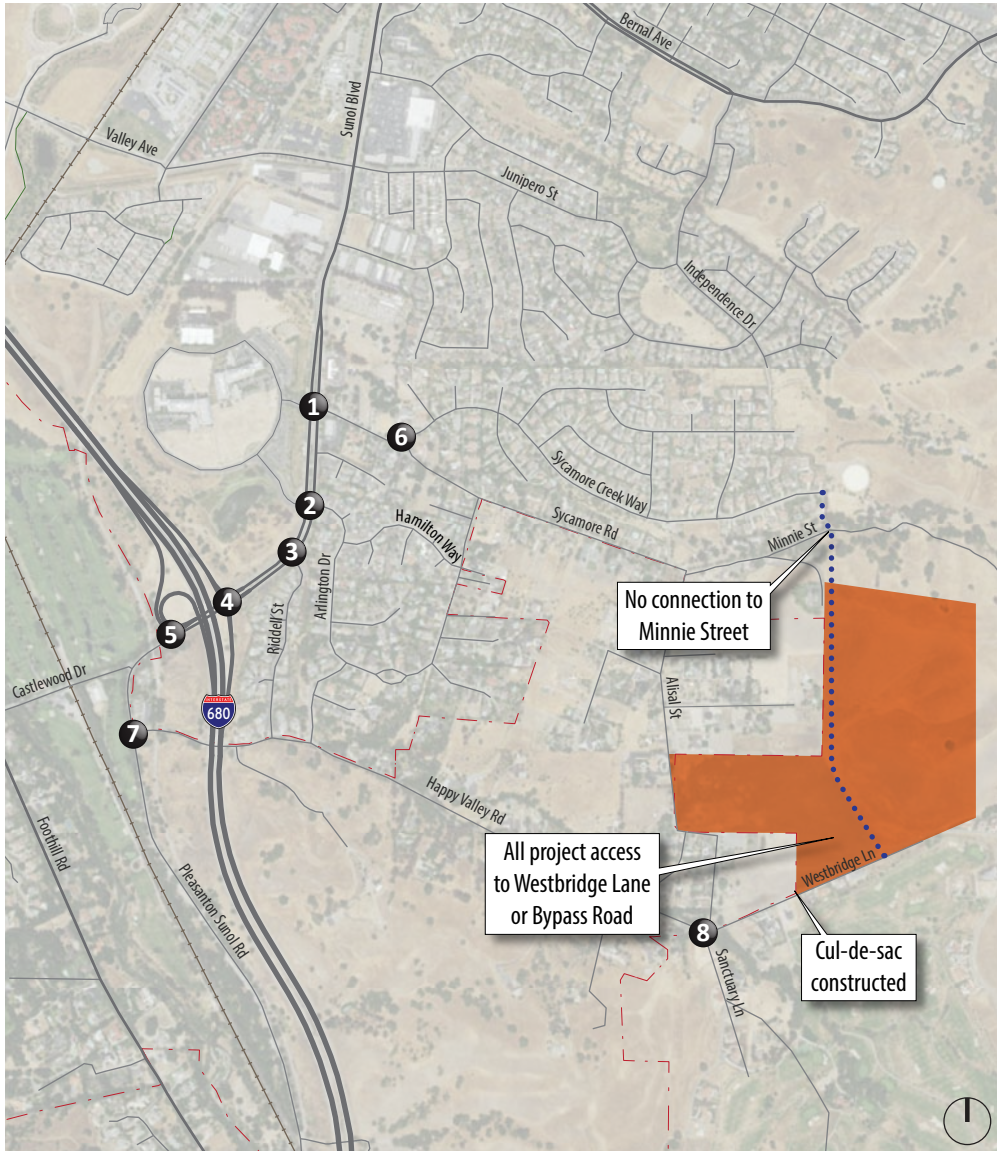
Project Site

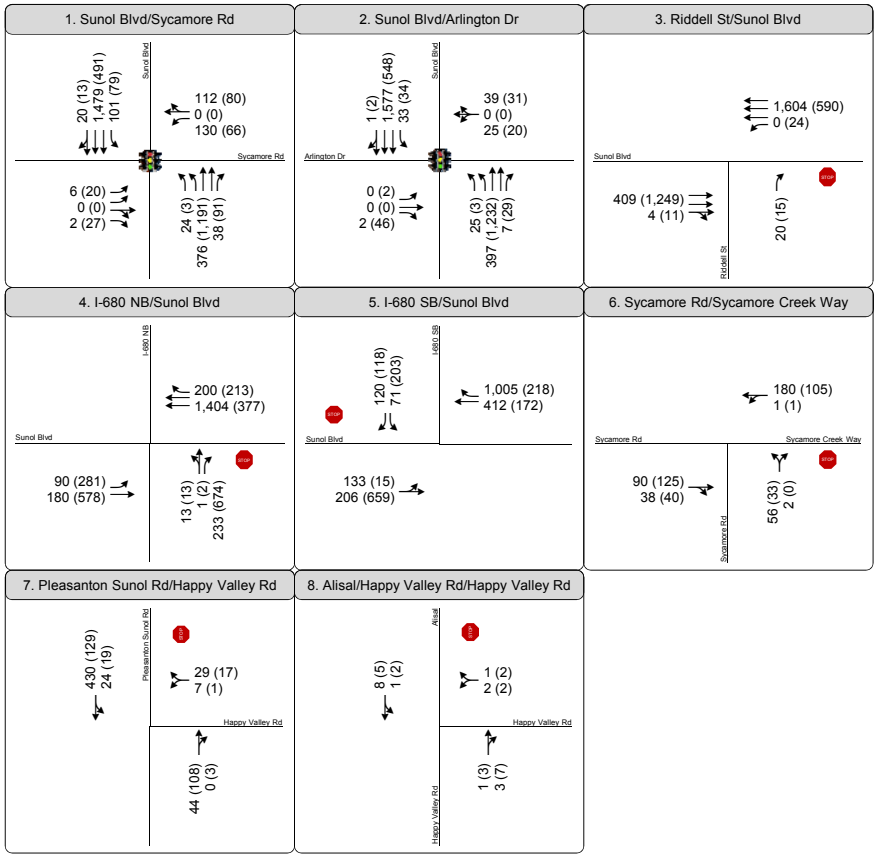
Study Intersection

Potential Bypass Roadway

Figure 9

## Existing with Project without Bypass Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Figure 10

# Existing with Project with Bypass Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC17-3392_10_Vol-Existing+P+Bypass

**TABLE 6**
**EXISTING CONDITIONS WITH PROJECT**
**PEAK HOUR LEVEL OF SERVICE**

| Intersection | Control[1] | Peak Hour | Existing Without Project | | Existing Without Bypass Road | | Existing With Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 12<br>13 | B<br>B | 12<br>14 | B<br>B | 14<br>13 | B<br>B |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 8<br>9 | A<br>A | 8<br>9 | A<br>A | 8<br>9 | A<br>A |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (10)<br>0 (14) | A (A)<br>A (B) | 0 (9)<br>0 (14) | A (A)<br>A (B) | 0 (9)<br>0 (14) | A (A)<br>A (B) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 (21)<br>5 **(62)** | A (C)<br>A **(F)** | 2 (21)<br>5 **(65)** | A (C)<br>A **(F)** | 2 (21)<br>4 **(59)** | A (C)<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | 2 (26)<br>6 **(38)** | A (D)<br>A **(E)** | 3 (27)<br>7 **(40)** | A (D)<br>A **(E)** | 2 (26)<br>7 **(40)** | A (D)<br>A **(E)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (10) | A (B)<br>A (A) | 3 (11)<br>3 (10) | A (B)<br>A (A) | 2 (11)<br>1 (11) | A (B)<br>A (B) |
| 7. Pleasanton Sunol Boulevard at Happy Valley Road | SSSC | AM<br>PM | 1 (9)<br>2 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) | 1 (10)<br>1 (9) | A (A)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) | 1 (9)<br>1 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) |

Notes:
1. SSSC = side-street stop controlled intersection; AWSC = all way stop control; Signal = signalized intersection.
2. Average intersection delay calculated for signalized intersections using the *2000 HCM* method.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2018.

Results of the level of service analysis show that the project would contribute to a slight worsening of already deficient operations for side-street movements at both the Sunol Boulevard northbound and southbound ramp intersections. All other study intersections would continue to operate within the City's level of service standard.

## SIGNAL WARRANT ASSESSMENT

The peak hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the Existing with Project conditions. Detailed signal warrant worksheets are provided in **Appendix C**, which show that the intersection of I-680 Southbound

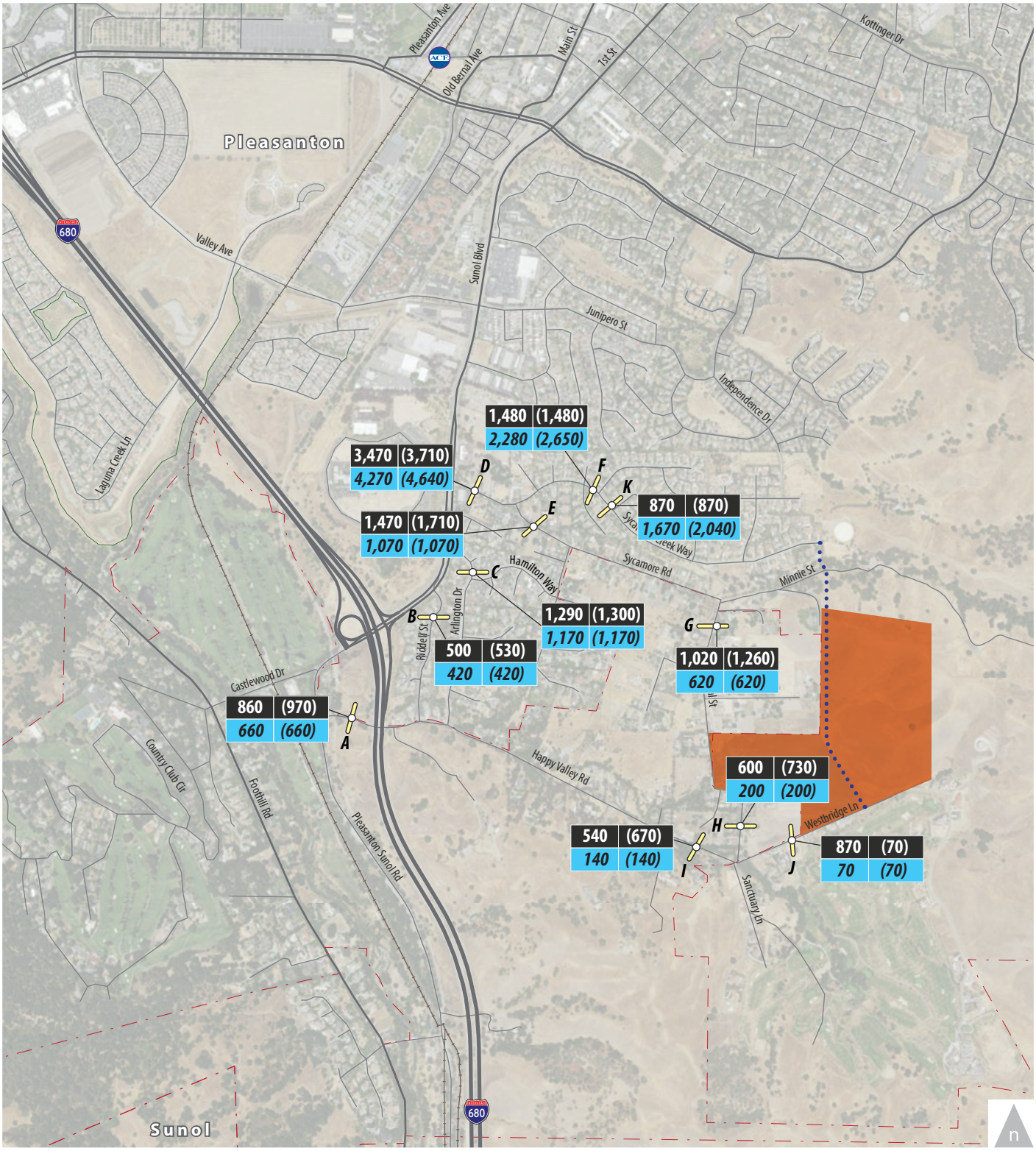
Ramps at Sunol Boulevard would continue to meet peak hour signal warrants with the addition of project traffic, without or with the bypass road. No other intersections would satisfy peak hour signal warrants.

## ROADWAY SEGMENTS

The amount of project traffic that is expected on each of the study roadway segments was estimated based on the project trip generation and trip distribution under conditions without and with the bypass road. For conditions with the bypass road, existing traffic shifts were also considered, with the resulting volumes summarized in **Table 7** and **Figure 11**.

Without the bypass Road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic (Sycamore Creek Way).

The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated to Sycamore Creek Way.




**LEGEND**

Project Site

XX (YY)
XX (YY)

**Without Bypass Road**
Without Project (With Project)
*With Bypass Road*
*Without Project (With Project)*

X Study Segment

Potential Bypass Roadway

Figure 11

# Existing Weekday Without and With Project Daily Roadway Segment Volumes

WC17-3392_11_WeekdayADT-EX

**TABLE 7**
**EXISTING WITH PROJECT DAILY TRAFFIC VOLUMES**

| Roadway | Facility Type | Existing Weekday Daily Traffic | Percent Daily Fluctuation | Existing with Project without Bypass Road | | | Existing with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Shift of Existing Traffic | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 860 | ±4% | 110 | 970 | **13%** | -200 | 660 | 0 | 660 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 500 | ±2% | 30 | 530 | **6%** | -80 | 420 | 0 | 420 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,290 | ±4% | 10 | 1,300 | 1% | -120 | 1,170 | 0 | 1,170 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 3,470 | ±5% | 240 | 3,710 | **7%** | 800[5] | 4,270 | 370 | 4,640 | **9%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,470 | ±6% | 240 | 1,710 | **16%** | -400 | 1,070 | 0 | 1,070 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,480 | ±7% | 0 | 1,480 | 0% | 800[5] | 2,280 | 370 | 2,650 | **16%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,020 | ±8% | 240 | 1,260 | **24%** | -400 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 600 | ±3% | 130 | 730 | **22%** | -400 | 200 | 0 | 200 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 540 | ±1% | 130 | 670 | **24%** | -400 | 140 | 0 | 140 | 0% |

**TABLE 7**
**EXISTING WITH PROJECT DAILY TRAFFIC VOLUMES**

| Roadway | Facility Type | Existing Weekday Daily Traffic | Percent Daily Fluctuation | Existing with Project without Bypass Road | | | Existing with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Shift of Existing Traffic | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 870[3] | ±3 | -800 | 70[4] | -- | -800 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 870 | ±8% | 0 | 870 | 0% | 800[5] | 1,670 | 370 | 2,040 | **22%** |

Notes: **Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.

1. Based on weekday daily Project trip generation and distribution percentages; for segment J, includes traffic shifts associated with the project roadway network changes. Although travel patterns through segment H would also change, the relative magnitude of vehicle traffic would remain relatively unchanged.
2. Reflects shifts of existing traffic with the project construction of a cul-de-sac at Westbridge Lane at Sanctuary Lane.
3. Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment.
4. Reflects remaining traffic volume estimate on the portion of Westbridge Lane between Alisal Street and Sanctuary Lane.
5. During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of this analysis, although it would decrease the percent increase in traffic volumes due to the project.

Source: Fehr & Peers, 2018

## CONSTRUCTION ASSESSMENT

The assessment of construction activity considers construction vehicles (including vehicles removing or delivering fill material, bulldozers, and other heavy machinery, as well as building materials delivery) and construction worker activity.

Given the topography of the site, import and/or export of fill is expected. Truck traffic would follow designated truck routes. Project construction would likely stage any large vehicles (i.e., earth-moving equipment, cranes, etc.) on the site prior to beginning site work and remove these vehicles at project completion. As such, a daily influx of construction equipment is unlikely.

Detailed information relating to the construction schedule during site development or a construction management plan is not available. However, it is expected that construction workers, deliveries, City inspectors and other construction activity could add traffic to the surrounding roadways and could create potential conflicts with other roadway users, such as construction related activities resulting in lane closures along the project frontage, construction vehicles queuing within the public right-of-way waiting entry to the site, construction worker parking in non-designated parking areas, or construction debris on public streets.

# EXISTING IMPACTS AND MITIGATION MEASURES

This section evaluates the intersection LOS results presented in **Table 6** and compares the results with the criteria for significant impacts. As a condition of approval, the City of Pleasanton will collect applicable local and regional traffic impact fees in addition to fair share contributions for other improvements needed to mitigate significant impacts. This is consistent with the City policy to collect fees from projects that have a significant impact on local and regional facilities.

***Impact Statement 1***: Intersection 4 - I-680 Northbound Ramps at Sunol Boulevard

The I-680 Northbound Ramps at Sunol Boulevard intersection operates at an overall acceptable service level during the PM peak hour, although deficient LOS F operations are experienced for the side-street movement. Peak hour signal warrants are not satisfied at this intersection in the existing condition, even considering the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement, but would not increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore the project impact to this intersection is considered ***less-than-significant*** and no mitigation is required.

Although there is not a project specific impact at this intersection, the City of Pleasanton plans to improve the I-680 interchange at Sunol Boulevard and will be evaluating various alternatives which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps and improving the merge zone on I-680. The project would contribute its fair share towards these improvements through the payment of local and regional transportation impact fees.

***Impact Statement 2***: Intersection 5 - I-680 Southbound Ramps at Sunol Boulevard

The I-680 Southbound Ramps at Sunol Boulevard intersection operates at an overall acceptable service level during the PM peak hour, although deficient LOS E operations are experienced for the side-street movement. Peak hour signal warrants are satisfied at this intersection in the existing condition prior to the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement, but would not result in LOS F operations for the controlled movement, increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore the project impact to this intersection is considered ***less-than-significant*** and no mitigation is required.

Although there is not a project specific impact at these intersections, the City of Pleasanton does have plans to improve the I-680 interchange at Sunol Boulevard and will be evaluating various alternatives which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps and improving the merge zone on I-680. The project would contribute its fair share towards these improvements through the payment of local and regional transportation impact fees.

***Impact Statement 3:*** Construction related activities could create potential conflicts with other roadway users, such as construction related activities resulting in lane closures along the project frontage, construction vehicles queuing within the public right-of-way waiting entry to the site, construction worker parking in non-designated parking areas, or construction debris on public streets. Construction impacts would be temporary in nature; however, this impact is considered ***potentially significant***.

> ***Mitigation Measure 3:*** Although construction impacts would be temporary, development of a construction management plan would reduce the potential for construction vehicle conflicts with other roadway users. The plan should include:
>
> - Project staging plan to maximize on-site storage of materials and equipment
> - A set of comprehensive traffic control measures, including scheduling of major truck trips and deliveries to avoid peak hours; lane closure proceedings; signs, cones, and other warning devices for drivers; and designation of construction access routes
> - Permitted construction hours
> - Location of construction staging

- Identification of parking areas for construction employees, site visitors, and inspectors, including on-site locations
- Provisions for street sweeping to remove construction related debris on public streets

Implementation of the construction management plan would reduce the temporary construction impact to a ***less-than-significant*** level.

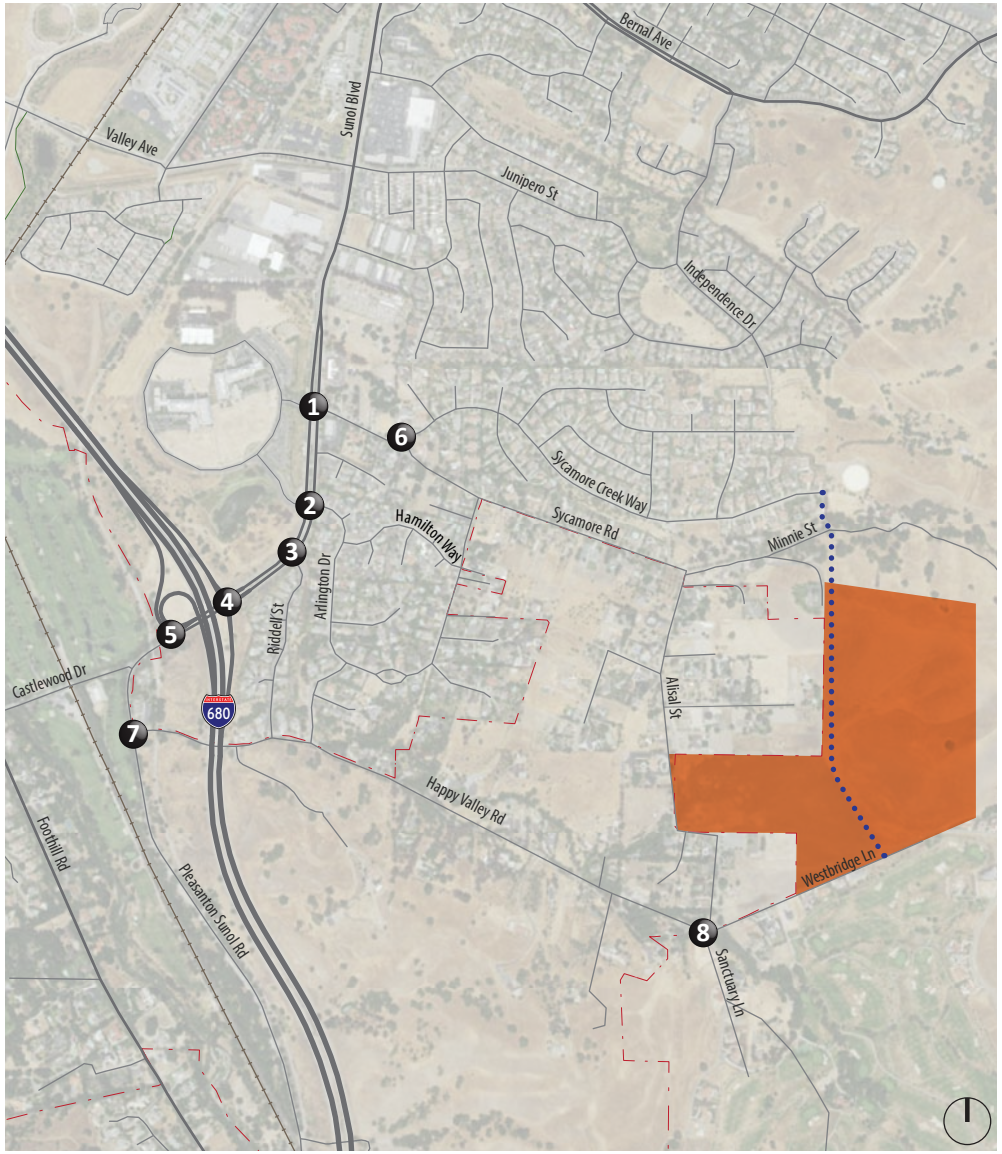
# 5.0 NEAR-TERM CONDITIONS

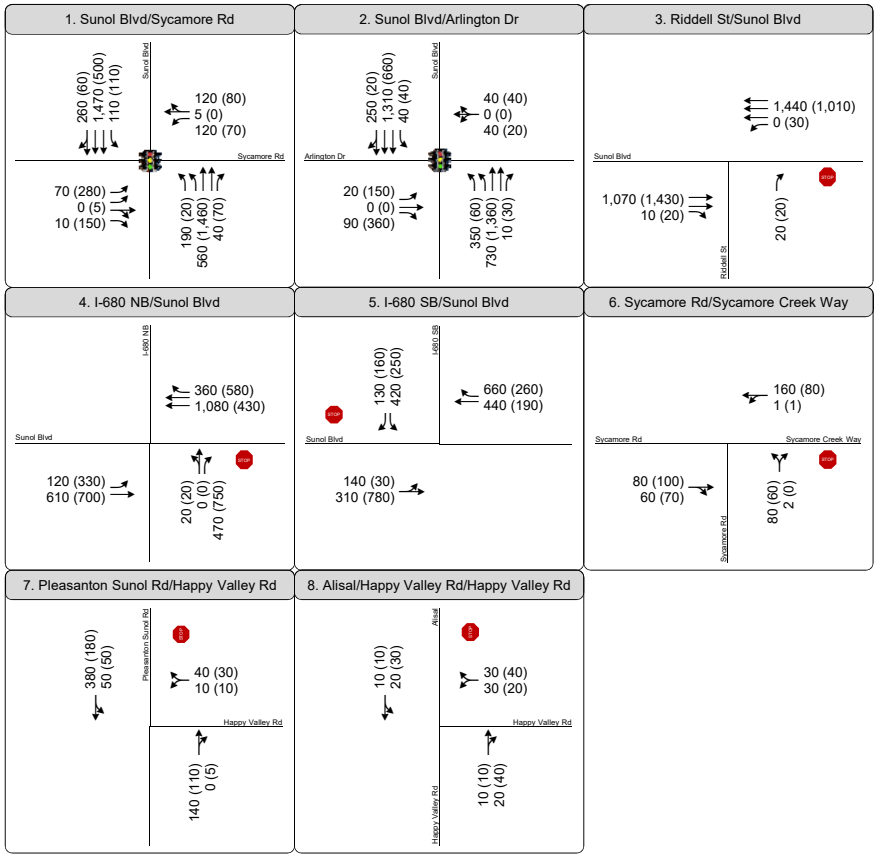
This chapter presents the results of the level of service calculations under near-term conditions without and with the project. Traffic volumes for Near-term without Project conditions comprise existing volumes plus traffic generated by approved but not yet constructed and occupied developments in the area, plus roadway network improvements that are conditioned by development considered in the traffic forecasts. Other reasonably foreseeable roadway improvements were also considered. Near-term with Project conditions are defined as Near-term without Project conditions plus net new traffic generated by the proposed project. Conditions without and with the bypass road are assessed.

## NEAR-TERM FORECASTS AND ROADWAY IMPROVEMENTS

Near-Term without Project conditions include transportation system improvements that are planned and funded, or conditioned on approved development, and traffic volume increases due to approved and pending developments plus regional growth. Near-Term conditions reflect a five to ten year time horizon, during which development of the project could be completed. Traffic volumes for the Near-Term condition were developed based on preliminary forecasts prepared for the City of Pleasanton Model Update, representing existing traffic, plus traffic from approved developments in the City. These forecasts were reviewed to ensure that approved and pending projects in the area were considered in the forecasts, which include the Lund Ranch Development that is approved to construct 31 single-family homes that would have access through Sunset Creek Lane and 11 single-family homes with access through Lund Ranch Road, and up to 49 single-family homes within the study area on various parcels including the Callipe Preserve/ Municipal Golf Course, Bach Property and TTK property. The forecasts also reflect additional development at the ThermoFisher Scientific Campus on the west side of Sunol Boulevard at Sycamore Road and Arlington Drive.

Although no roadway improvements are assumed in the immediate project area that affect study intersection configurations, improvements to State Route 84 were assumed, which is expected to shift some regional through traffic from Sunol Boulevard to State Route 84, as well as completion of high-occupancy vehicle lanes on Interstate 680 from north of Interstate 580 through the Sunol Boulevard interchange. The resulting the Near-Term without Project traffic volumes are shown on **Figure 12.** The project traffic volumes from Figure 7 and Figure 8 were added to the Near-term without Project traffic volumes to estimate the Near-term with Project traffic volumes, as shown on **Figure 13** for conditions without the bypass road and **Figure 14** for conditions with the bypass road. The with project traffic volumes also consider the shifts of existing and projected traffic through the project site (Figure 13), and to the bypass road (Figure 14).




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

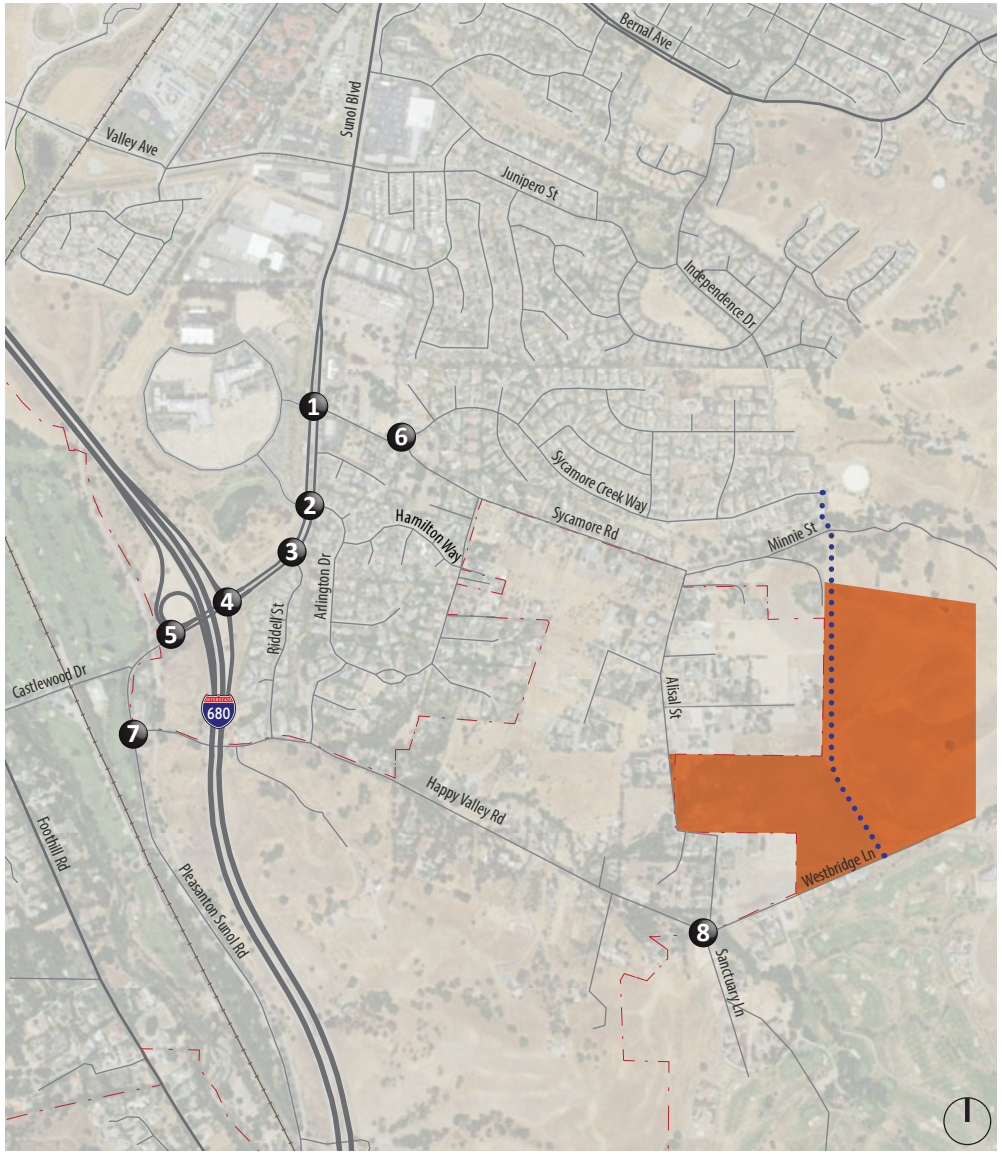
Project Site

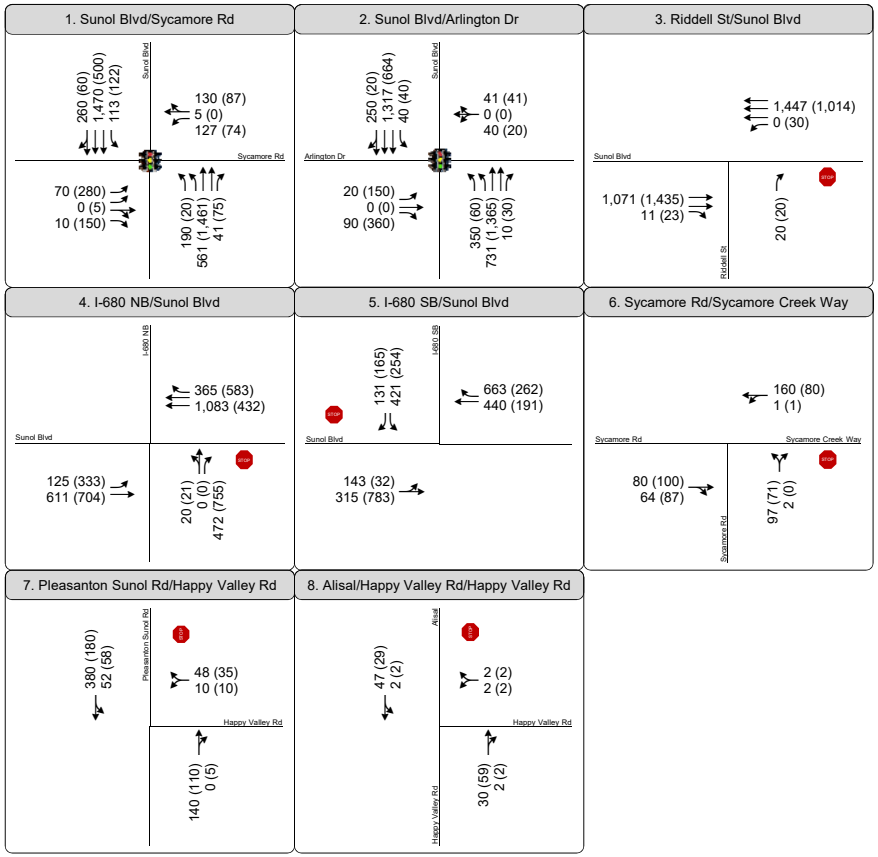
Study Intersection

Potential Bypass Roadway

Figure 12

## Near-Term without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

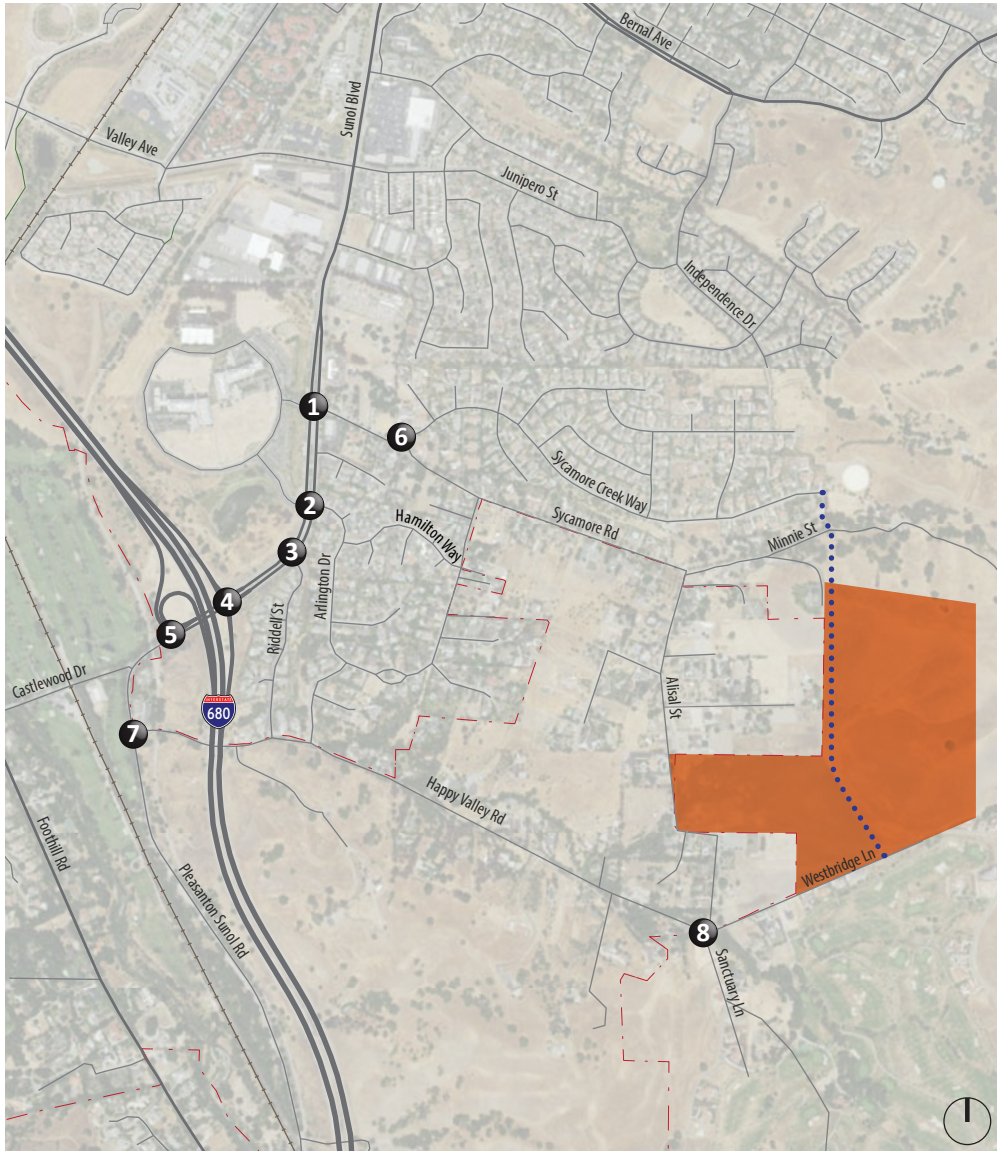
Study Intersection

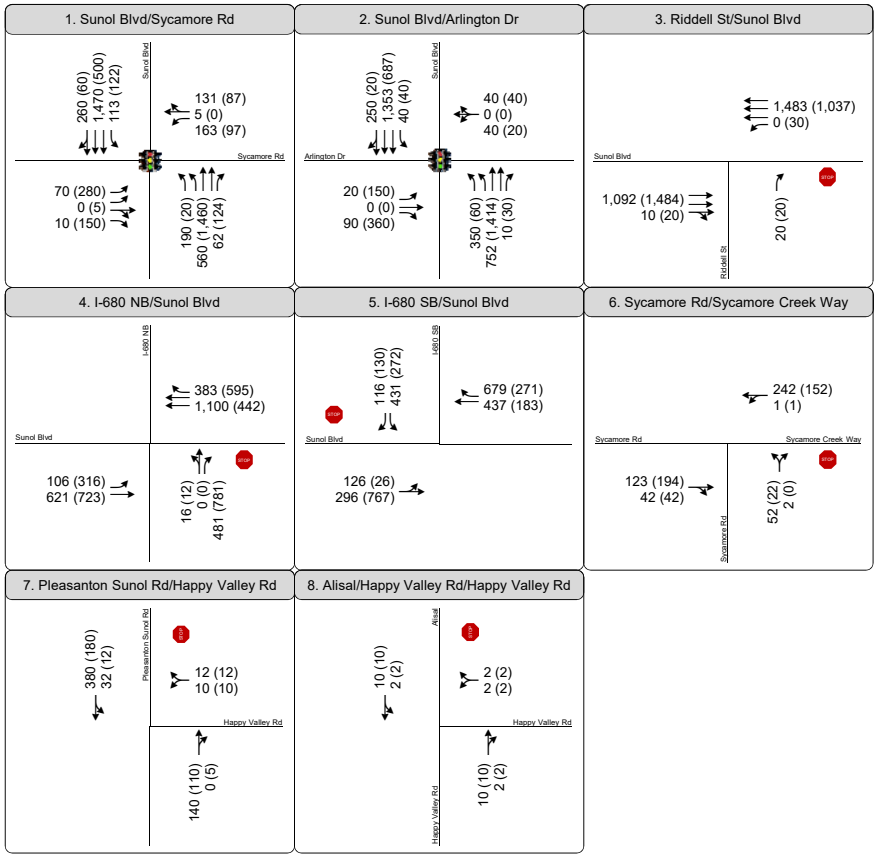
Potential Bypass Roadway

Figure 13

# Near-Term with Project without Bypass Road Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

WC17-3392_13_Vol-NearTerm+P




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Figure 14

## Near-Term with Project with Bypass Road Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

# ANALYSIS OF NEAR-TERM CONDITIONS

## INTERSECTION LEVELS OF SERVICE

Level of service calculations were conducted to evaluate intersection operations under Near-term conditions both without and with the project, and without and with the bypass road. The LOS results are summarized in **Table 8.** The corresponding LOS calculation sheets are included in **Appendix B**.

In the near-term condition, operations of the Sunol Boulevard at I-680 ramps would further degrade, but all other study intersections would continue to operate at acceptable levels. The addition of project traffic would further degrade operations at the interchange, but all other study intersections would continue to operate at an acceptable service level without or with the bypass road.

## SIGNAL WARRANT ASSESSMENT

The peak hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the Near-term condition. Detailed signal warrant worksheets are provided in **Appendix C,** which show that the unsignalized intersection of Sunol Boulevard at I-680 Southbound Ramps would continue to meet signal warrants. No other unsignalized intersections would meet signal warrants.

## ROADWAY SEGMENTS

The amount of project traffic that is expected on each of the study roadway segments in the near-term condition was estimated based on the existing traffic, projections of new from approved and pending projects, and project traffic under conditions without and with the bypass road. For conditions with the bypass road, existing traffic shifts were also considered, with the resulting volumes summarized in **Table 9** and **Figure 15.**

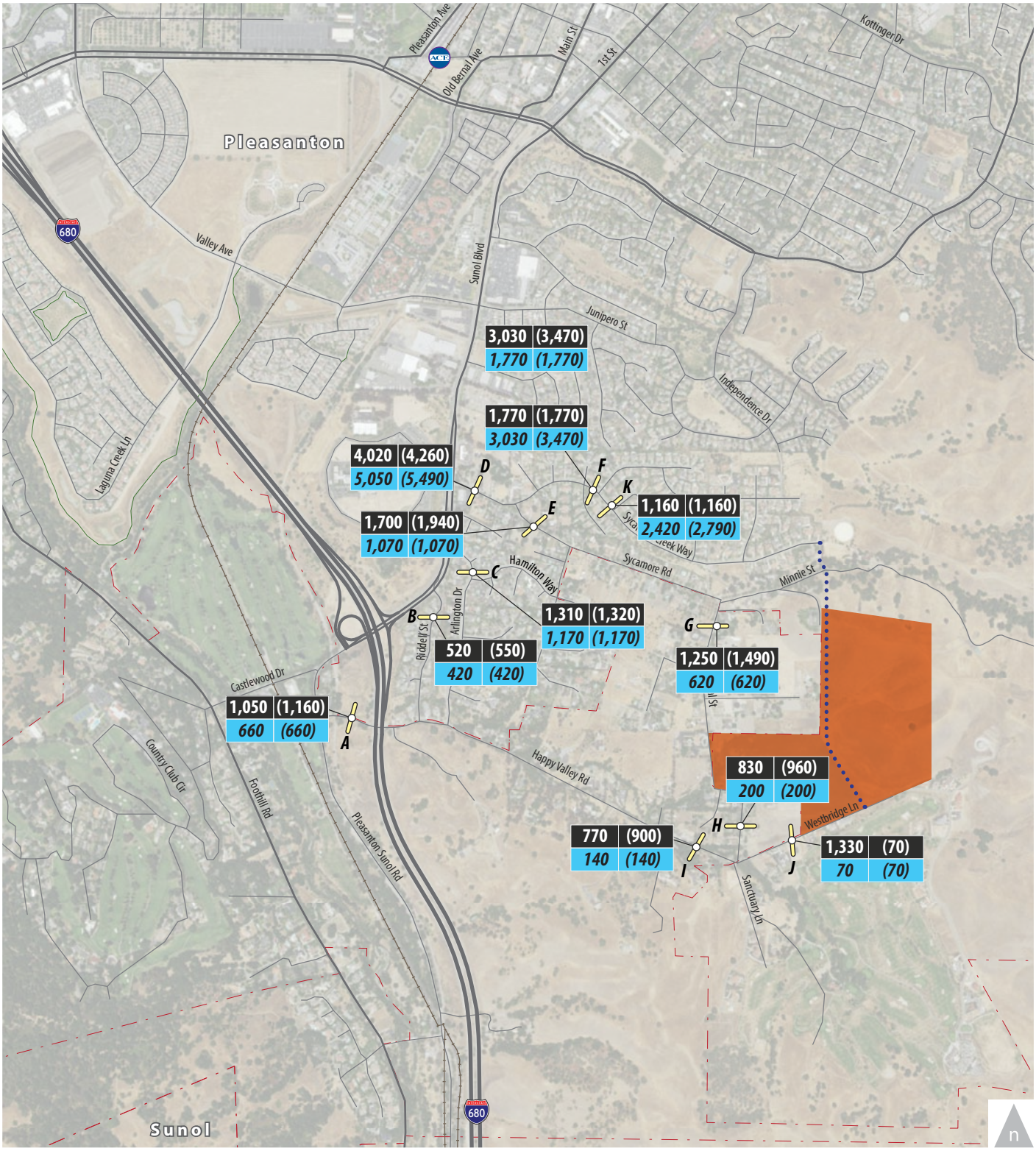
Without the bypass road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic (Sycamore Creek Way).

**TABLE 8**
**NEAR-TERM CONDITIONS**
**PEAK HOUR INTERSECTION LEVELS OF SERVICE**

| Intersection | Control[1] | Peak Hour | Near-Term without Project | | Near-Term with Project without Bypass Road | | Near-Term with Project with Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 21<br>27 | C<br>C | 21<br>30 | C<br>C | 21<br>25 | C<br>C |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 17<br>18 | B<br>B | 17<br>19 | B<br>B | 17<br>18 | B<br>B |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (13)<br>0 (16) | A (B)<br>A (C) | 0 (13)<br>0 (16) | A (B)<br>A (C) | 0 (11)<br>0 (16) | A (B)<br>A (C) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 2 **(46)**<br>4 **(>90)** | A **(E)**<br>A **(F)** | 2 **(47)**<br>5 **(>90)** | A **(E)**<br>A **(F)** | 2 **(41)**<br>4 **(>90)** | A **(E)**<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | **>90 (>90)**<br>22 **(>90)** | **F (F)**<br>C **(F)** | **>90 (>90)**<br>24 **(>90)** | **F (F)**<br>C **(F)** | **>90 (>90)**<br>26 **(>90)** | **F (F)**<br>D **(F)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 2 (11)<br>2 (11) | A (B)<br>A (B) | 3 (11)<br>2 (11) | A (B)<br>A (B) | 1 (12)<br>1 (11) | A (B)<br>A (B) |
| 7. Pleasanton Sunol Boulevard at Happy Valley Road | SSSC | AM<br>PM | 2 (11)<br>2 (10) | A (B)<br>A (A) | 2 (11)<br>2 (10) | A (B)<br>A (A) | 1 (11)<br>1 (10) | A (B)<br>A (A) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 6 (9)<br>5 (9) | A (A)<br>A (A) | 1 (9)<br>1 (9) | A (A)<br>A (A) | 2 (9)<br>2 (9) | A (A)<br>A (A) |

Notes:
1. SSSC = side-street stop controlled intersection; Signal = signalized intersection.
2. Average intersection delay calculated for signalized intersections using the *2000 HCM* method.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2018.




**LEGEND**

Project Site

XX (YY)
XX (YY)

**Without Bypass Road**
Without Project (With Project)
*With Bypass Road*
*Without Project (With Project)*

X Study Segment

Potential Bypass Roadway

Figure 15

Near-Term Weekday Without and With Project
Daily Roadway Segment Volumes

WC17-3392_15_WeekdayADT-NT

**TABLE 9**
**NEAR-TERM DAILY TRAFFIC VOLUME ASSESSMENT**

| Roadway | Facility Type | Near-term Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Near-term with Project without Bypass Road | | | Near-Term with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 1,050 | ±4% | 110 | 1,160 | **10%** | -390 | 660 | 0 | 660 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 520 | ±2% | 30 | 550 | **6%** | -100 | 420 | 0 | 420 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,310 | ±4% | 10 | 1,320 | 1% | -140 | 1,170 | 0 | 1,170 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 4,020 | ±5% | 240 | 4,260 | **6%** | 1,260[4] | 5,050 | 370 | 5,490 | **7%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,700 | ±6% | 240 | 1,940 | **14%** | -630 | 1,070 | 0 | 1,070 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,770 | ±7% | 0 | 1,770 | 0% | 1,260[4] | 3,030 | 370 | 3,470 | **12%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,250 | ±8% | 240 | 1,490 | **19%** | -630 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 830 | ±3% | 130 | 960 | **16%** | -630 | 200 | 0 | 200 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 770 | ±1% | 130 | 900 | **17%** | -630 | 140 | 0 | 140 | 0% |

**TABLE 9**
**NEAR-TERM DAILY TRAFFIC VOLUME ASSESSMENT**

| Roadway | Facility Type | Near-term Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Near-term with Project without Bypass Road | | | Near-Term with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 1,330[2] | ±3 | -1,260 | 70[3] | -- | -1,260 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 1,160 | ±8% | 0 | 1,160 | 0% | 1,260[4] | 2,420 | 370 | 2,790 | **15%** |

Notes: **Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.

1. Based on weekday daily Project trip generation and distribution percentages; for segment J, includes traffic shifts associated with the project roadway network changes. Although travel patterns through segment H would also change, the relative magnitude of vehicle traffic would remain relatively unchanged.
2. Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, existing traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment due to golf course activities, a 230 vehicle increase from existing condition, which would result in the same 230 vehicle increase under near-term without project conditions.
3. Reflects remaining traffic volume estimate on the portion of Westbridge Lane between Alisal Street and Sanctuary Lane.
4. During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of this analysis, although it would decrease the percent increase in traffic volumes due to the project.

Source: Fehr & Peers, 2018

The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated to Sycamore Creek Way.

## NEAR-TERM INTERSECTION IMPACTS AND MITIGATION MEASURES

This section evaluates the intersection LOS results presented in Table 8 and compares the results with the criteria for significant impacts. As a condition of approval, the City of Pleasanton will collect applicable local and regional traffic impact fees in addition to fair share contributions for other improvements needed to mitigate significant impacts. This is consistent with the City policy to collect fees from projects that have a significant impact on local and regional facilities.

***Impact Statement 4***: Intersection 4 - I-680 Northbound Ramps at Sunol Boulevard

The I-680 Northbound Ramps at Sunol Boulevard intersection is projected to operate at an overall acceptable service level during both the morning and evening peak hours, although deficient operations are experienced for the side-street movement (LOS E/AM peak, LOS F/PM peak). Peak hour signal warrants are not satisfied at this intersection in the near-term condition, even considering the addition of project traffic. The addition of project traffic would slightly increase delay for the side-street movement during the PM peak hour from 122 seconds to 130 seconds, but would not increase delay by more than 30 seconds during either peak hour or increase traffic on the controlled approach by more than 10 vehicles per lane during either peak hour. Therefore the project impact to this intersection is considered ***less-than-significant*** and no mitigation is required.

***Impact Statement 5***: Intersection 5 - I-680 Southbound Ramps at Sunol Boulevard

The I-680 Southbound Ramps at Sunol Boulevard intersection is projected to operate at an overall unacceptable level during the morning peak hour and an acceptable service level during the PM peak hour. Deficient LOS F operations would be experienced for the side-street movement in both peak hours. Peak

hour signal warrants are satisfied at this intersection in the existing condition prior to the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour from 652 seconds to 676 seconds and during the evening peak hour from 122 seconds to 130 seconds, but would not increase delay by more than 30 seconds or increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore the project impact to this intersection is considered ***less-than-significant*** and no mitigation is required.

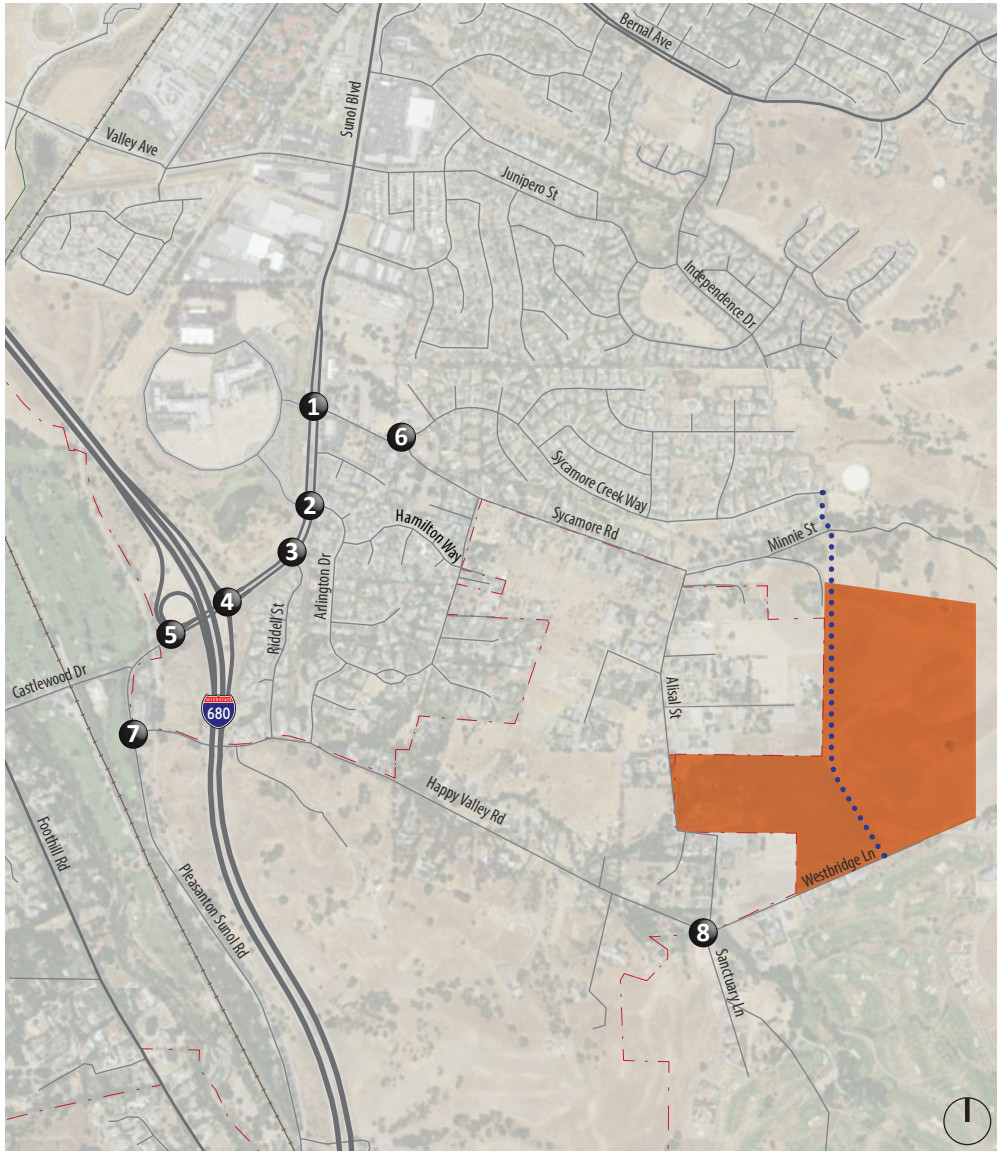
# 6.0 CUMULATIVE CONDITIONS

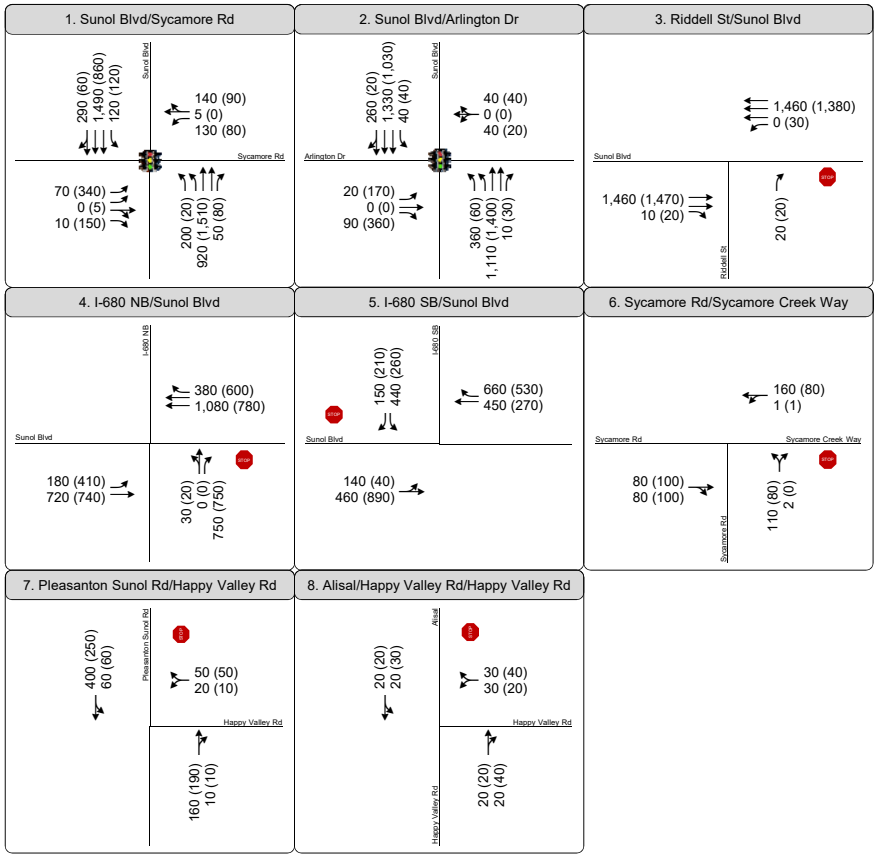
This chapter presents the results of the level of service calculations under cumulative conditions without and with the project. Traffic volumes for the Cumulative without Project condition comprises existing volumes plus traffic generated by approved but not yet constructed and occupied developments in the area, plus traffic from projects consistent with the General Plan that could be developed. Cumulative with Project conditions are defined as Cumulative without Project conditions plus net new traffic generated by the proposed project. Conditions without and with the bypass road are assessed.

## CUMULATIVE FORECASTS AND ROADWAY IMPROVEMENTS

Cumulative without Project conditions include transportation system improvements that are planned with the reasonable expectation of being funded, or are conditioned on approved development, and traffic volume increases due to approved and pending developments, as well as development that could occur under the current General Plan plus regional growth. Traffic volumes for the Cumulative condition were developed based on preliminary forecasts prepared for the City of Pleasanton Model Update, representing existing traffic, plus traffic from approved developments in the City, and development that could occur under the current General Plan plus regional growth. These forecasts were developed using a computerized traffic model and represent likely traffic conditions in the area over the next 20 to 25 years. These forecasts were reviewed to ensure that the appropriate level of development was considered, including near-term development discussed in Chapter 5, plus additional development in the area that could occur. Aside from development on the Spotorno Property, development of an additional 40 single-family homes within the Happy Valley area was identified in the model, which includes development of between 1 and 8 homes of a number of parcels distributed throughout the area.

Although no roadway improvements are assumed in the immediate project area that affect study intersection configurations, improvements to State Route 84 were assumed, which is expected to shift some regional through traffic from Sunol Boulevard to State Route 84, as well as completion of high-occupancy vehicle lanes on Interstate 680 from north of Interstate 580 through the Sunol Boulevard interchange. The resulting the Cumulative without Project traffic volumes are shown on **Figure 16.** The project traffic volumes from Figure 7 and Figure 8 were added to the Cumulative without Project traffic volumes to estimate the Cumulative with Project traffic volumes, as shown on **Figure 17** for conditions without the bypass road and **Figure 18** for conditions with the bypass road. The with project traffic volumes also consider the shifts of existing and projected traffic through the project site (Figure 17), and with the bypass road (Figure 18).




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

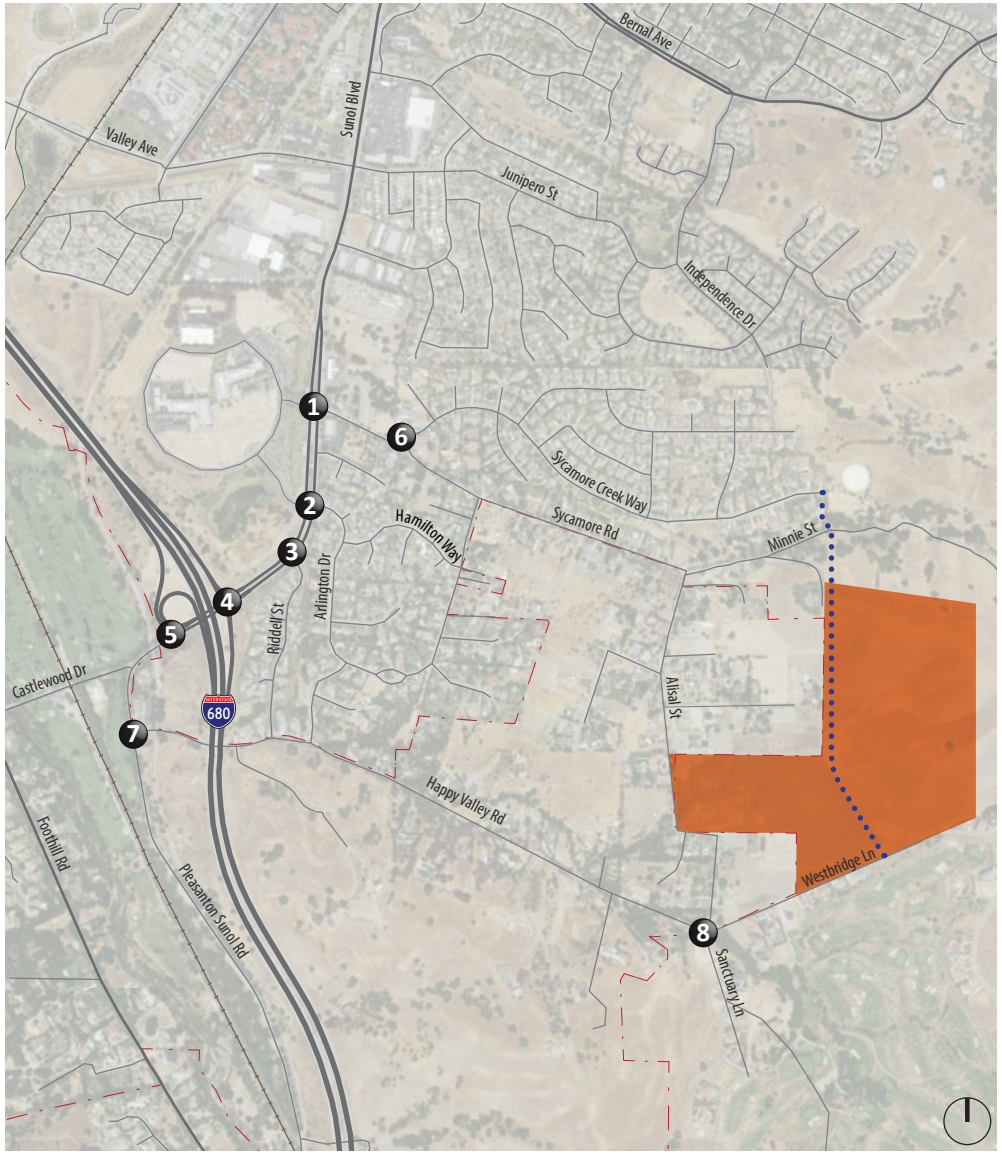
Project Site

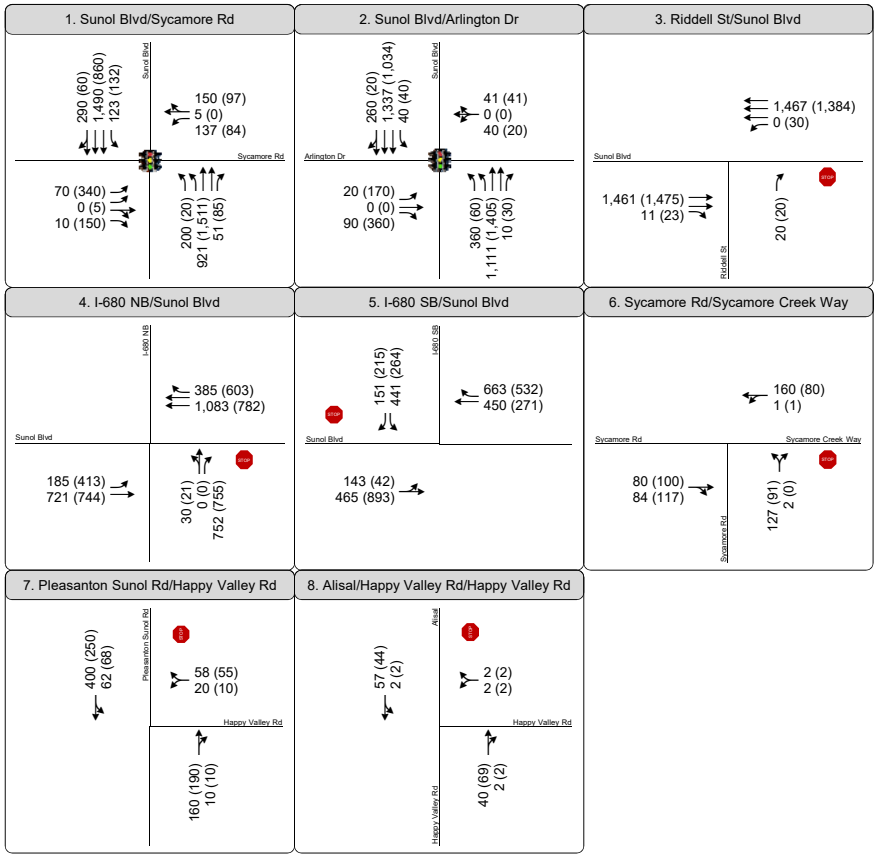
Study Intersection

Potential Bypass Roadway

Figure 16

## Cumulative without Project Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

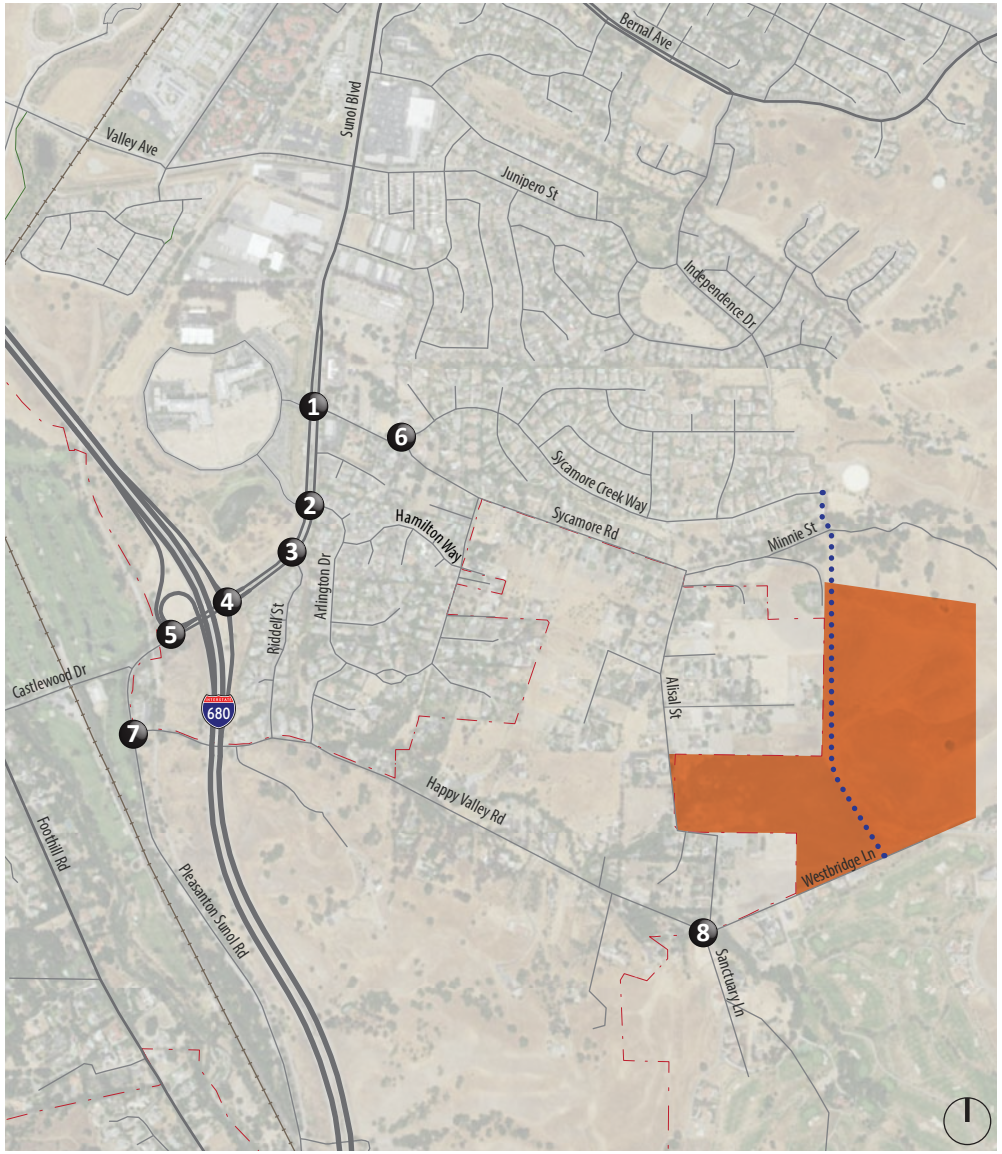
Project Site

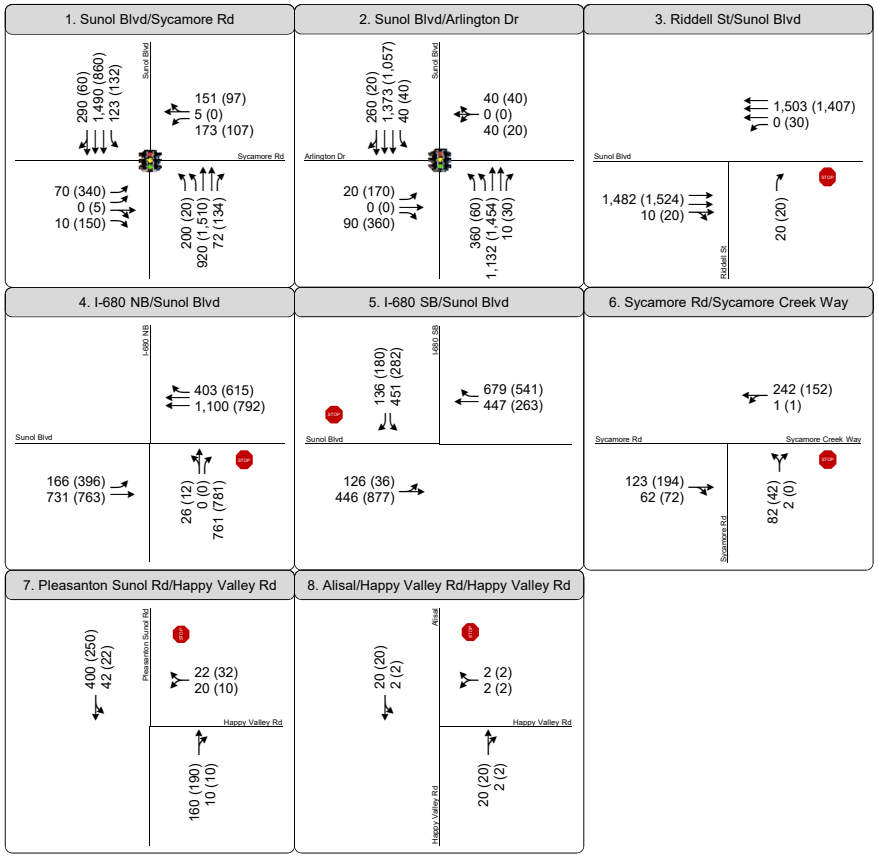
Study Intersection

Potential Bypass Roadway

Figure 17

## Cumulative with Project without Bypass Road Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls




**LEGEND**

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection

Stop Sign

Project Site

Study Intersection

Potential Bypass Roadway

Figure 18

## Cumulative with Project with Bypass Road Peak Hour Intersection Traffic Volumes, Lane Configurations and Traffic Controls

# ANALYSIS OF CUMULATIVE CONDITIONS

## INTERSECTION LEVELS OF SERVICE

Level of Service calculations were conducted to evaluate intersection operations under Cumulative conditions both without and with the project. The LOS results are summarized in **Table 10**. Signal timings were optimized at the signalized intersections, as the City regularly monitor signal operations throughout the City to ensure optimal traffic flow through critical corridors. The corresponding LOS calculation sheets are included in **Appendix B**.

In the cumulative condition, operations of the Sunol Boulevard at I-680 ramps would further degrade; all other study intersections would continue to operate at acceptable levels. The addition of project traffic would further degrade operations at the interchange, but all other study intersections would continue to operate at an acceptable service level without or with the bypass road.

## SIGNAL WARRANT ASSESSMENT

The peak hour volume and the delay warrant were used in this study as a supplemental analysis tool to assess operations at unsignalized intersections in the cumulative condition. Detailed signal warrant worksheets are provided in **Appendix C,** which show that the unsignalized intersection of Sunol Boulevard at I-680 Southbound Ramps would continue to meet signal warrants. No other unsignalized study intersection would meet signal warrants.

## ROADWAY SEGMENTS

The amount of project traffic that is expected on each of the study roadway segments in the near-term condition was estimated based on the existing traffic, projections of new from approved and pending projects, and project traffic under conditions without and with the bypass road. For conditions with the bypass road, existing traffic shifts were also considered, with the resulting volumes summarized in **Table 11.**

Without the bypass road, the project is expected to increase traffic volumes on a number of roadway segments between 10 vehicles per day (such as Riddell Street), and 240 vehicles per day (Alisal Street north of project roadway and Sycamore Road east of Sycamore Creek Way). With the bypass road, project traffic in the area would be concentrated on fewer roadways, with those roadways accommodating all project traffic (Sycamore Creek Way).

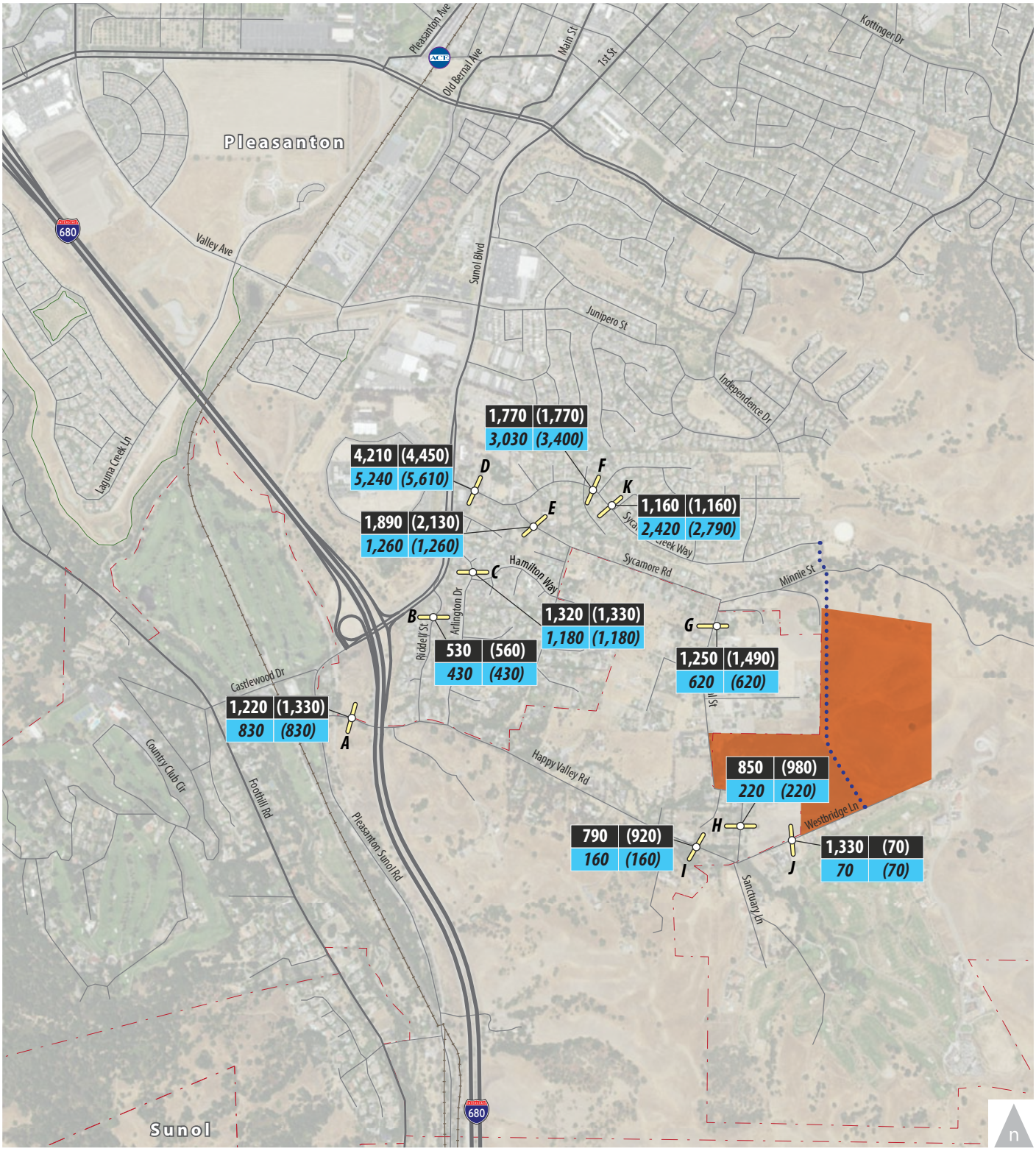
The amount of traffic that is reasonable for a residential street is highly subjective and can vary significantly from person to person. For designated local residential roadway segments, average daily traffic volumes around 1,500 vehicles per day are considered the upper limit while volumes up to around 3,000 vehicles per day are tolerated on designated residential collector streets. There is no standard of significance for daily roadway volumes on residential streets in Pleasanton. The projected percent increase in daily traffic volume was compared to the existing daily volume fluctuation, which shows that the volume increase associated with the project (without bypass road) would be most notable on Happy Valley Road, Alisal Street, Riddell Street, Sycamore Road, and the portion of Sycamore Creek Way between Sunol Boulevard and Sycamore Road. With the bypass road, traffic volume increases would be concentrated to Sycamore Creek Way.

**TABLE 10**
**CUMULATIVE CONDITIONS**
**PEAK HOUR INTERSECTION LEVELS OF SERVICE**

| Intersection | Control[1] | Peak Hour | Cumulative without Project | | Cumulative with Project without Bypass Road | | Cumulative with Project with Bypass Road | |
|---|---|---|---|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] | Delay[2,3] | LOS[3] |
| 1. Sunol Boulevard at Sycamore Road | Signal | AM<br>PM | 20<br>30 | B<br>C | 20<br>32 | B<br>C | 21<br>29 | C<br>C |
| 2. Sunol Boulevard at Arlington Drive | Signal | AM<br>PM | 17<br>19 | B<br>B | 17<br>20 | B<br>B | 17<br>21 | B<br>C |
| 3. Sunol Boulevard at Riddell Street | SSSC | AM<br>PM | 0 (17)<br>0 (16) | A (C)<br>A (C) | 0 (17)<br>0 (16) | A (C)<br>A (C) | 0 (13)<br>0 (17) | A (B)<br>A (C) |
| 4. Sunol Boulevard at I-680 Northbound Ramps[4] | SSSC | AM<br>PM | 4 **(>90)**<br>7 **(>90)** | A **(F)**<br>A **(F)** | 4 **(>90)**<br>7 **(>90)** | A **(F)**<br>A **(F)** | 4 **(>90)**<br>5 **(>90)** | A **(F)**<br>A **(F)** |
| 5. Sunol Boulevard at I-680 Southbound Ramps[4] | SSSC | AM<br>PM | **>90 (>90)**<br>**42 (>90)** | **F (F)**<br>**E (F)** | **>90 (>90)**<br>**45 (>90)** | **F (F)**<br>**E (F)** | **>90 (>90)**<br>**48 (>90)** | **F (F)**<br>**E (F)** |
| 6. Sycamore Creek Way at Sycamore Road | SSSC | AM<br>PM | 3 (11)<br>2 (11) | A (B)<br>A (B) | 3 (12)<br>3 (11) | A (B)<br>A (B) | 2 (12)<br>1 (11) | A (B)<br>A (B) |
| 7. Pleasanton Sunol Boulevard at Happy Valley Road | SSSC | AM<br>PM | 2 (12)<br>2 (11) | A (B)<br>A (B) | 2 (12)<br>2 (11) | A (B)<br>A (B) | 2 (12)<br>1 (11) | A (B)<br>A (B) |
| 8. Happy Valley Road at Alisal Street | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) | 1 (9)<br>0 (9) | A (A)<br>A (A) | 1 (9)<br>1 (9) | A (A)<br>A (A) |

Notes:
1. SSSC = side-street stop controlled intersection; Signal = signalized intersection.
2. Average intersection delay calculated for signalized intersections using the *2000 HCM* method.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr & Peers, 2018.




**LEGEND**

Project Site

XX (YY)
XX (YY)

**Without Bypass Road**
Without Project (With Project)
*With Bypass Road*
*Without Project (With Project)*

X Study Segment

Potential Bypass Roadway

Figure 19

# Cumulative Weekday Without and With Project Daily Roadway Segment Volumes

WC17-3392_19_WeekdayADT-CU

**TABLE 11**
**CUMULATIVE DAILY TRAFFIC VOLUME ASSESSMENT**

| Roadway | Facility Type | Cumulative Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Cumulative with Project without Bypass Road | | | Cumulative with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| A. Happy Valley Road (e/o Pleasanton Sunol Road) | Residential Collector | 1,220 | ±4% | 110 | 1,330 | **9%** | -390 | 830 | 0 | 830 | 0% |
| B. Riddell Street (s/o Sunol Boulevard) | Local Street | 530 | ±2% | 30 | 560 | **6%** | -100 | 430 | 0 | 430 | 0% |
| C. Arlington Drive (e/o Sunol Boulevard) | Local Street | 1,320 | ±4% | 10 | 1,330 | 1% | -140 | 1,180 | 0 | 1,180 | 0% |
| D. Sycamore Creek Way (e/o Sunol Boulevard) | Residential Collector | 4,210 | ±5% | 240 | 4,450 | **6%** | 1,260[4] | 5,240 | 370 | 5,610 | **7%** |
| E. Sycamore Road (e/o Sycamore Creek Way) | Residential Collector | 1,890 | ±6% | 240 | 2,130 | **13%** | -630 | 1,260 | 0 | 1,260 | 0% |
| F. Sycamore Creek Way (w/o Summit Creek Lane) | Residential Collector | 1,770 | ±7% | 0 | 1,770 | 0% | 1,260[4] | 3,030 | 370 | 3,400 | **12%** |
| G. Alisal Street (s/o Sycamore Road) | Residential Collector | 1,250 | ±8% | 240 | 1,490 | **19%** | -630 | 620 | 0 | 620 | 0% |
| H. Alisal Street (n/o Happy Valley Road) | Residential Collector | 850 | ±3% | 130 | 980 | **15%** | -630 | 220 | 0 | 220 | 0% |
| I. Happy Valley Road (w/o Alisal Street) | Residential Collector | 790 | ±1% | 130 | 920 | **16%** | -630 | 160 | 0 | 160 | 0% |

**TABLE 11**
**CUMULATIVE DAILY TRAFFIC VOLUME ASSESSMENT**

| Roadway | Facility Type | Cumulative Without Project Weekday Daily Traffic | Percent Daily Fluctuation | Cumulative with Project without Bypass Road | | | Cumulative with Project with Bypass Road | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Project Daily Added Traffic[1] | With Project Volume | Percent Increase | Traffic Shift (existing and approved projects) | With bypass Road Without Project Volume | Project Daily Added Traffic[1] | Total Traffic | Percent Increase Due to Project Trips Only |
| J. Westbridge Lane (e/o Alisal Street) | Local Street | 1,330[2] | ±3 | 0 | 70[3] | -- | -1,260 | 70 | 0 | 70 | 0% |
| K. Sycamore Creek Way (e/o Summit Creek Lane) | Residential Collector | 1,160 | ±8% | 0 | 1,160 | 0% | 1,260[4] | 2,420 | 370 | 2,790 | **15%** |

Notes: **Bold** indicates that added traffic due to project is greater than the existing daily roadway volume fluctuation and would be noticeable to existing residents.

1. Based on weekday daily Project trip generation and distribution percentages; for segment J, includes traffic shifts associated with the project roadway network changes. Although travel patterns through segment H would also change, the relative magnitude of vehicle traffic would remain relatively unchanged.
2. Traffic counts collected by the City of Pleasanton during summer months indicate that on some peak days, existing traffic volumes have been observed to be as high as 1,100 vehicles per day on this roadway segment due to golf course activities, a 230 vehicle increase from existing condition, which would result in the same 230 vehicle increase under cumulative without project conditions.
3. Reflects remaining traffic volume estimate on the portion of Westbridge Lane between Alisal Street and Sanctuary Lane.
4. During peak summer months, traffic volumes shifted from the golf course could be up to 230 vehicles higher than presented here. This potential increase during the summer months would not affect the overall conclusions of the analysis, although it would decrease the percent increase in traffic volumes due to the project.

Source: Fehr & Peers, 2018

# CUMULATIVE INTERSECTION IMPACTS AND MITIGATION MEASURES

This section evaluates the intersection LOS results presented in Table 10 and compares the results with the criteria for significant impacts. As a condition of approval, the City of Pleasanton will collect applicable local and regional traffic impact fees in addition to fair share contributions for other improvements needed to mitigate significant impacts. This is consistent with the City policy to collect fees from projects that have a significant impact on local and regional facilities.

***Impact Statement 6***: Intersection 4 - I-680 Northbound Ramps at Sunol Boulevard

The I-680 Northbound Ramps at Sunol Boulevard intersection is projected to operate at an overall acceptable service level during both the morning and evening peak hours, although deficient operations are experienced for the side-street movement. Peak hour signal warrants are not satisfied at this intersection in the cumulative condition, even considering the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour from 125 seconds to 133 seconds and during the evening peak hour from 461 seconds to 492 seconds. As project traffic would increase delay by more than 30 seconds, this increase is considered ***significant.*** This impact would not occur under conditions with the bypass road.

> ***Mitigation Measure 6:*** The City of Pleasanton plans to improve the I-680 interchange at Sunol Boulevard and is undertaking a process to evaluate various alternatives in coordination with Caltrans which may include signalization of the ramp terminal intersections, widening Sunol Boulevard, widening on-ramps and improving the merge zone on I-680. The project is fully funded through the design stage in the Capital Improvement Program, including provisions to reimburse Caltrans for their costs, which has been approved by City Council. The remainder of the improvement project cost would be funded through the City's Development Impact Fee Program, which contains the full cost of potential improvements at this interchange.
>
> The project would contribute its fair share towards these improvements through the payment of local and regional transportation impact fees. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

***Impact Statement 7***: Intersection 5 - I-680 Southbound Ramps at Sunol Boulevard

The I-680 Southbound Ramps at Sunol Boulevard intersection is projected to operate at an overall unacceptable level during the morning peak hour and an acceptable service level during the PM peak hour. Deficient operations would be experienced for the side-street movement in both peak hours. Peak hour

signal warrants are satisfied at this intersection in the existing condition prior to the addition of project traffic. The addition of project traffic would increase delay for the side-street movement during the morning peak hour, but the amount cannot be calculated. During the during the evening peak hour, delay would increase from 342 seconds to 362 seconds, less than 30 seconds. During the morning peak hour when delay cannot be calculated for the side-street movement, the project would not increase traffic on the controlled approach by more than 10 vehicles per lane. Therefore the project impact to this intersection is considered ***less-than-significant*** and no mitigation is required.

# 7.0 OTHER CONSIDERATIONS

As a detailed site plan is has not been developed, this chapter provides overall guidance for consideration as the project plan is finalized.

## VEHICULAR SITE ACCESS AND CIRCULATION

All vehicular site access is proposed to occur from Alisal Street which connects Sycamore Road to Happy Valley Road. As part of the project, a cul-de-sac would be constructed on Westbridge Lane at Sanctuary Lane, with all traffic on Westbridge Drive east of Sanctuary Lane rerouted through the project site, via the proposed Clubhouse Drive, to Alisal Street. Operations of the site access intersection on Alisal Street was evaluated, as presented in **Table 12**, which shows the site access intersection would operate within the City's level of service standard in the cumulative condition, as a side-street stop-controlled intersection.

**TABLE 12**
**SITE ACCESS INTERSECTION**
**PEAK HOUR INTERSECTION LEVELS OF SERVICE – WITHOUT BYPASS ROAD**

| Intersection | Control[1] | Peak Hour | Cumulative with Project | |
|---|---|---|---|---|
| | | | Delay[2,3] | LOS[3] |
| Alisal Street at Clubhouse Drive | SSSC | AM<br>PM | 5 (9)<br>5 (9) | A (A)<br>A (A) |

Notes:
1. SSSC = side-street stop controlled intersection
2. Average intersection delay calculated for signalized intersections using the 2000 HCM method.
3. For SSSC intersections, average delay or LOS is listed first followed by the delay or LOS for the worst approach in parentheses.

Source: Fehr and Peers, 2018.

Although the site access intersection and other intersections internal to Happy Valley would operate within the City's level of service standard, as shown in the preceding chapters, the project would add traffic to roadways in the study area that have sharp curves (Alisal Street). Under conditions with the bypass road, the project would not increase traffic on this facility and construction of the bypass road would change the travel patterns for existing traffic, reducing vehicle traffic on these roadways.

***Impact Statement 8:*** The project as proposed would increase vehicle traffic on a roadway that has sharp curves (Alisal Street at Sycamore Road and at Alisal Court). Based on the impact criteria in Chapter 1 under Other CEQA Considerations, this is a potentially ***significant*** impact as the project could increase traffic conflicts due to an existing design feature.

***Mitigation Measure 8:*** If the bypass road is not constructed as part of the project, the project applicant shall work with the City of Pleasanton and adjacent neighbors to identify and install additional traffic calming measures along Alisal Street at Sycamore Road and at Alisal Court that are consistent with the rural nature of the roadway. Installation of traffic calming features would reduce this impact to a ***less-than-significant*** level. Measures that could be considered include roundabouts, traffic circles, additional pavement markings, speed lumps and radar speed signs.

The daily roadway segment analysis presented in the preceding chapters indicates that future traffic volumes on Clubhouse Road through the project site could range from 1,260 (non-peak golf months) to 1,490 (peak golf months) daily vehicle trips in the cumulative condition. This is considered the upper limit for traffic volumes on local streets, and could create future conflicts between residents and through traffic.

***Site Recommendation 1:*** Consider limiting direct driveway access to Clubhouse Drive, or provide other measures acceptable to City of Pleasanton Traffic Engineering that would reduce potential conflicts between vehicles exiting driveways and traffic on Clubhouse Drive. Provide sidewalks with a landscape buffer on both sides of the street to further separate residential activities from the travel way.

## EMERGENCY VEHICLE ACCESS

Several factors determine whether a project has sufficient access for emergency vehicles, including:

1. Location of closest fire stations
2. Number of access points (both public and emergency access only)
3. Width of access points
4. Width of internal roadways

Each of these factors is discussed in further detail below.

The fire station closest to the site is located on Bernal Avenue at Oak Vista Way, approximately 3 ½-miles from the project connection to Alisal Street. Emergency vehicle access would also be provided at the through the new Westbridge cul-de-sac, providing additional emergency vehicle access to the project site and surrounding area if the connection to Alisal Street at Clubhouse Drive was blocked. Access to the project site would occur from existing roadways that would not be changed as part of the project.

Insufficient details are provided on the conceptual project site plan to evaluate the proposed roadway cross-section relative to emergency vehicle access.

***Site Recommendation 2:*** To ensure emergency vehicles have an unobstructed access throughout the site, parking should be restricted within the first 50 feet of the project entrances, and if landscaped medians or other entry treatments are proposed, a 20-foot clear area should be provided. If on-street parking is proposed, the street cross-section should be of sufficient width to accommodate parking lanes and maintain a 20-foot clear path of travel.

## PEDESTRIAN ACCESS AND CIRCULATION

There are no transit or bicycle facilities currently provided near the project site and none are planned to be constructed. No dedicated bicycle facilities are proposed within the project site. Should the bypass road be constructed, it should provide bicycle lanes to connect to the existing bicycle facilities on Sycamore Creek Way.

Currently there are two pedestrian facilities adjacent to the site: the Happy Valley Loop Trail and Golf Course Loop Trail. The Happy Valley Specific Plan identifies the Spotorno Flat Area Trail (number 4 on the HVSP Trails Plan exhibit) within the Spotorno property area. In addition, the HVSP identifies two trails within the Sportorno property area: the "Bypass Road Trail" (number 3 on the HVSP Trails Plan exhibit), and the "Spotorno MDR/Foley Ranch Trail connection" (number 7A on the exhibit), which would connect from the Bypass Road trail, to the east. The 1993 Trails Master Plan shows trails along Westbridge Lane, and connecting from Minnie Street (approximately) across the north edge of the Specific Plan area to the east. The 1993 Master Plan shows a range of facility types and designs, ranging from "Class A" regional trails, "Class B" trails that are separated from streets, and "Class C" trails, which are local/connector trails that are typically on-street, with widths ranging from 4 to 8 feet, depending on location and use.

The City is currently undertaking an update to the Trails Master Plan, with adoption expected in late 2018. The April 2018 Public Review Draft of the updated Master Plan further defines these trails to include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of the proposed Clubhouse Drive extension; a trail along Westbridge Lane, connecting to additional proposed trails within the northeast part of Callippe Preserve; and additional trails through the hillside portion of the property that would connect Spotorno Flat to the Foley property to the east, and Lund Ranch. Note that, although the updated Trails Master Plan Update is not yet adopted, it likely will be adopted before the project is considered for approval by the City, and therefore it has been determined appropriate to consider the project for conformance with this document.

***Impact Statement 9:*** The proposed project's site plan identifies a 6-foot-wide trail (4-foot paved with a 2-foot earthen edge) along the proposed Clubhouse Drive extension through the project; a 6-foot wide graded earth trail along Westbridge Lane and Clubhouse Drive where it terminates at the water tank, and a

connector from the Callippe Preserve Trail east to the Foley Property boundary. The project does not propose a north-south trail connection through the hillside portion of the property that is equivalent to that shown in the HVSP or April 2018 Public Review Draft Trails Master Plan.

This proposed trail along the Clubhouse Drive extension through the property meets the HVSP standard trail width identified in the Trail Summary Table in the HVSP; however, the April 2018 Public Review Draft of the updated Master Plan requires a trail width of 8 feet, and the existing 1993 Trails Master Plan states that trails up to 8 feet in width may be required, if conditions allow. The facility also does not meet Class I design standards, which is a minimum of 8-feet wide plus 2-foot shoulders. Based on the significant criteria, this is a ***significant*** impact.

General Plan Policy 7, Program 7.3 specifies that new developments should "Design complete streets serving pedestrians, bicyclists, motorists, and transit riders of all ages and abilities, except where infeasible. Complete streets may include: alternative intersection control where appropriate; requiring bicycle and pedestrian connections from cul-de-sacs to adjacent streets, trails, bicycle paths, and neighborhoods; and incorporating appropriate traffic calming measures." Given the context of the project, providing a Class I trail would meet the City's complete streets requirements.

Mitigation Measure 9 would ensure the proposed trail system, including trail widths and designs would be consistent with the HVSP and Draft Trails Master Plan and that the plan is consistent with General Plan Policy 7, Program 7.3. Therefore, with implementation of Mitigation Measure 9, the project impact would reduce to a ***less-than-significant*** level.

> ***Mitigation Measure 9:*** Prior to issuance of building permits, the project applicant shall submit site plans that would be consistent with the intent of the planned network shown in the Draft Trails Master Plan and Happy Valley Specific Plan, including one or more north-south connections through the project, or an alternative trail connection determined by the City to be equivalent, to that connection. All trails shall be designed as required for the applicable facility type in the Draft Trails Master Plan. The site plans shall show that pedestrian and bicycle connections are provided from cul-de-sacs to adjacent streets where applicable, such as at the new Westbridge Lane cul-de-sac, and there are no conflicts with General Plan Policy 7, Program 7.3. In addition, trail construction shall be completed prior to issuance of occupancy permits.

## BICYCLE ACCESS AND CIRCULATION

Bicycle facilities are currently provided on portions of Sunol Boulevard and Sycamore Creek Way. The *2018 Pedestrian and Bicycle Master Plan* identifies the provision of buffered bicycle lanes on Sunol Boulevard

from Foothill Road to Bernal Avenue, and a Class I path along the transportation corridor, providing an off-street connection from south of Sunol Boulevard to Downtown Pleasanton.

The *1993 Trails Master Plan* identifies a trail within the Spotorno property area; the February 2018 *Working Draft of the Pleasanton Trails Master Plan* further defines these trails to include a Class I/Multi-Use trail connecting Alisal Street to Westbridge Lane, generally along the alignment of Clubhouse Drive, and a wide, improved surface trail connecting from the property line west of the water tank to the Lund Ranch trails (extension of Callippe Preserve Trail). Neither are shown on the site plan.

The *Happy Valley Specific Plan* identifies two trails within the Spotorno property area, including one that would connect Alisal Street to Westbridge Lane, and a second that connects Westbridge Lane to Sycamore Creek Way.

Should the bypass road be constructed, it should be designed to provided bicycle lanes, connecting to the existing bicycle lanes on Sycamore Creek Way.

No dedicated bicycle facilities are proposed within the project site.

***Impact Statement 10:*** The project site plan does not accommodate planned trail connections, which conflicts with planned pedestrian or bicycle facilities (see Impact Statement 9). Based on the significance criteria, this is a ***significant*** impact.

> ***Mitigation Measure 10:*** Implement Mitigation Measure 9. Modify the site plan to provide trails consistent with the *Trails Master Plan* and the *Happy Valley Specific Plan*, including modifying the proposed Clubhouse Drive trail to meet Class I path standards. Implementation of this measure would reduce the project impact to a ***less-than-significant*** level.

## TRANSIT ACCESS ADJACENT TO SITE

Transit service is not provided in the study area and it is not expected to be provided as part of this project.

## PARKING

Parking for the project would be provided by private off-street garages as well as driveways. On-street parking may also be provided should sufficient right-of-way be provided. It is expected that all required off-street parking would be provided as part of the project.

# OTHER CEQA CONSIDERATIONS

Based on Appendix G of the CEQA guidelines, other CEQA criteria were also assessed based on the information presented above.

- Would the Project 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?
    - The project is not located in proximity to an airport and would not result in a change to air traffic patterns. Therefore, there is no impact to air travel.
- Would the Project substantially increase traffic hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?
    - Although the project would be designed to meet City standards, it would increase vehicular travel on roadways with sharp curves. Measures to lessen the potential impact to these existing hazards are provided as part of **Mitigation Measure 8**.
- Would the project result in inadequate emergency access?
    - One primary access location and one emergency access location is show on the conceptual project site plan. Recommendations to consider as the site plan is finalized are provided as part of Site Recommendation 1.
- Would the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?
    - No transit facilities are provided in the area and none are planned. Therefore, the project would not conflict with adopted policies, plans, or programs regarding public transit.
    - The project site plan does not accommodate planned trail connections, as identified in the *Trails Master Plan* and the *Happy Valley Specific Plan*. The conceptual project site plan identifies a 4-foot trail with a 2-foot earthen trail along Clubhouse Drive, which does not meet Class I facility design standards, which is a minimum of 8-feet wide plus 2-foot shoulders. The Callippe Preserve Trail extension is not shown on the conceptual project site plan. Measures to lessen this impact are identified as part of **Mitigation Measure 9**.

# 8.0 VEHICLE MILES OF TRAVEL

In response to Senate Bill 743 (SB 743), the Office of Planning and Research (OPR) is updating California Environmental Quality Act (CEQA) guidelines to include new transportation-related evaluation metrics. Draft guidelines were developed in August 2014, with updated draft guidelines prepared January 2016 which incorporated public comments from the August 2014 guidelines, and final guidelines published in November 2017. New guidelines are undergoing the formal rule making process with compliance expected by January 1, 2020. In response to the draft guidelines, this preliminary assessment of the vehicle miles of travel (VMT) generated by the proposed project was prepared.

The following provides a brief project description, language of the draft CEQA guidelines related to VMT, and preliminary results of the VMT assessment for the project. As neither the City of Pleasanton nor the Alameda CTC have established thresholds, and the new guidelines have not yet been adopted, this assessment is prepared for informational purposes only.

## CEQA GUIDELINES

Proposed changes to Appendix G of the CEQA guidelines, as presented in *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA (November 2017)*[7] provides the potential basis for the evaluation of vehicle miles of travel generated by a project.

**<u>Text of Proposed Amendments to Appendix G</u>**

*b) For a land use project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?*

**(b) Criteria for Analyzing Transportation Impacts.**

**(1) Land Use Projects.** Vehicle miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high quality transit corridor should be presumed to cause a less than significant transportation impact. Projects that decrease vehicle miles traveled in the project area compared to existing conditions should be considered to have a less than significant transportation impact.

[7] Full document can be found here:
http://www.fehrandpeers.com/wp-content/uploads/2016/01/Revised_VMT_CEQA_Guidelines_Proposal_January_20_2016.pdf

OPR has established a draft threshold for the evaluation of different land use types. For residential uses, new developments that have an estimated vehicle miles of travel 15 percent below **existing** city VMT/capita (household or home-based) would be considered less than significant, if the proposed development does not result in the number of dwelling units to exceed the number of dwelling units identified in the Sustainable Communities Strategy (SCS) for that City, and must be consistent with the SCS. If not, the **existing** regional VMT/capita would be used as the baseline.

For office uses, developments that would result in VMT 15 percent below **existing** regional VMT per employee (work tour or home-based work) would be considered less than significant.

Local-serving retail may be less than significant (projects less than 50,000 square feet). Retail which increases VMT compared to previous shopping patterns may be considered significant.

As neither the City of Pleasanton nor the Alameda CTC have established thresholds, and the new guidelines have not yet been adopted, this assessment is prepared for informational purposes only.

## ANALYSIS METHODS

To conduct the VMT assessment, Fehr & Peers used the City of Pleasanton travel demand model as well as information from the Metropolitan Transportation Commission (MTC). The City of Pleasanton model was used to estimate average trip lengths for the proposed project as well as calculate a city-wide average, while MTC data[8] was used to establish average residential trip lengths for the region. The city-wide average VMT per household estimated using the City of Pleasanton model was within 4 percent of the city-wide average calculated using the MTC model. The results are presented in **Table 13**.

The existing average home-based trip lengths for Pleasanton are slightly higher than the regional average; home based trips are defined as trips that have at least one trip end at home, including trips from home to work, school, shopping, or other purposes. VMT per capita for the proposed project is expected to be higher than either the city-wide or regional average. This is primarily due to the project's location where there are limited opportunities for walk, bicycle or transit trips, and its distance from the regional roadway network.

[8] http://analytics.mtc.ca.gov/foswiki/Main/PlanBayAreaVmtPerCapita

**TABLE 13**
**EXISTING AVERAGE VMT**

| Land Use Type | Project | Project With Bypass Road | City of Pleasanton | Regional |
|---|---|---|---|---|
| Home Based VMT per Capita | 35.3 | 35.7 | 17.7 | 15.3 |

Source: Fehr and Peers, 2018. MTC, 2018.

## VMT CONCLUSIONS

Results of the VMT analysis indicate that the project would contribute to an increase in vehicle miles of travel on a per-capita basis as the project adds a housing development that would require residents to travel longer-than-average distances to meet their daily needs. As there are no thresholds of significance, this analysis is being prepared for informational purposes only.

# APPENDIX A: TRAFFIC COUNTS

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-001 Sunol Blvd & Sycamore Rd
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Sunol Blvd Southbound | | | | | Sycamore Rd Westbound | | | | | Sunol Blvd Northbound | | | | | Sycamore Rd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 5 | 329 | 4 | 0 | 338 | 16 | 0 | 5 | 1 | 22 | 4 | 55 | 4 | 0 | 63 | 1 | 0 | 1 | 2 | 4 | 427 | 3 |
| 7:15 | 11 | 387 | 4 | 0 | 402 | 20 | 0 | 12 | 0 | 32 | 4 | 80 | 4 | 0 | 88 | 2 | 0 | 0 | 0 | 2 | 524 | 0 |
| 7:30 | 14 | 367 | 5 | 0 | 386 | 44 | 0 | 14 | 0 | 58 | 4 | 77 | 3 | 0 | 84 | 2 | 0 | 0 | 1 | 3 | 531 | 1 |
| 7:45 | 19 | 324 | 5 | 0 | 348 | 21 | 0 | 24 | 2 | 47 | 8 | 101 | 8 | 0 | 117 | 0 | 0 | 0 | 1 | 1 | 513 | 3 |
| Total | 49 | 1407 | 18 | 0 | 1474 | 101 | 0 | 55 | 3 | 159 | 20 | 313 | 19 | 0 | 352 | 5 | 0 | 1 | 4 | 10 | 1995 | 7 |
| 8:00 | 25 | 392 | 7 | 0 | 424 | 19 | 0 | 43 | 1 | 63 | 6 | 108 | 7 | 0 | 121 | 2 | 0 | 1 | 0 | 3 | 611 | 1 |
| 8:15 | 40 | 364 | 3 | 0 | 407 | 18 | 0 | 20 | 0 | 38 | 6 | 90 | 8 | 0 | 104 | 0 | 0 | 1 | 0 | 1 | 550 | 0 |
| 8:30 | 29 | 359 | 6 | 0 | 394 | 12 | 0 | 10 | 2 | 24 | 8 | 115 | 3 | 0 | 126 | 0 | 0 | 1 | 2 | 3 | 547 | 4 |
| 8:45 | 17 | 298 | 4 | 0 | 319 | 24 | 0 | 18 | 0 | 42 | 4 | 102 | 7 | 0 | 113 | 0 | 0 | 0 | 1 | 1 | 475 | 1 |
| Total | 111 | 1413 | 20 | 0 | 1544 | 73 | 0 | 91 | 3 | 167 | 24 | 415 | 25 | 0 | 464 | 2 | 0 | 3 | 3 | 8 | 2183 | 6 |
| 16:00 | 16 | 106 | 0 | 0 | 122 | 20 | 1 | 16 | 1 | 38 | 0 | 282 | 15 | 0 | 297 | 10 | 0 | 8 | 0 | 18 | 475 | 1 |
| 16:15 | 21 | 123 | 1 | 0 | 145 | 10 | 1 | 16 | 0 | 27 | 1 | 291 | 11 | 0 | 303 | 2 | 0 | 8 | 0 | 10 | 485 | 0 |
| 16:30 | 20 | 118 | 1 | 0 | 139 | 20 | 0 | 31 | 1 | 52 | 0 | 247 | 14 | 0 | 261 | 2 | 1 | 8 | 1 | 12 | 464 | 2 |
| 16:45 | 18 | 123 | 2 | 0 | 143 | 11 | 0 | 11 | 1 | 23 | 0 | 277 | 8 | 0 | 285 | 2 | 1 | 5 | 1 | 9 | 460 | 2 |
| Total | 75 | 470 | 4 | 0 | 549 | 61 | 2 | 74 | 3 | 140 | 1 | 1097 | 48 | 0 | 1146 | 16 | 2 | 29 | 2 | 49 | 1884 | 5 |
| 17:00 | 17 | 119 | 2 | 0 | 138 | 16 | 0 | 17 | 0 | 33 | 2 | 272 | 16 | 0 | 290 | 7 | 0 | 14 | 0 | 21 | 482 | 0 |
| 17:15 | 16 | 144 | 4 | 0 | 164 | 10 | 0 | 13 | 2 | 25 | 1 | 293 | 5 | 0 | 299 | 3 | 0 | 5 | 3 | 11 | 499 | 5 |
| 17:30 | 17 | 106 | 3 | 0 | 126 | 6 | 0 | 18 | 0 | 24 | 0 | 286 | 15 | 0 | 301 | 4 | 0 | 4 | 1 | 9 | 460 | 1 |
| 17:45 | 17 | 122 | 4 | 0 | 143 | 16 | 0 | 25 | 1 | 42 | 0 | 340 | 21 | 0 | 361 | 2 | 0 | 4 | 0 | 6 | 552 | 1 |
| Total | 67 | 491 | 13 | 0 | 571 | 48 | 0 | 73 | 3 | 124 | 3 | 1191 | 57 | 0 | 1251 | 16 | 0 | 27 | 4 | 47 | 1993 | 7 |
| Grand Total | 302 | 3781 | 55 | 0 | 4138 | 283 | 2 | 293 | 12 | 590 | 48 | 3016 | 149 | 0 | 3213 | 39 | 2 | 60 | 13 | 114 | 8055 | 25 |
| Apprch % | 7.3% | 91.4% | 1.3% | 0.0% | | 48.0% | 0.3% | 49.7% | 2.0% | | 1.5% | 93.9% | 4.6% | 0.0% | | 34.2% | 1.8% | 52.6% | 11.4% | | | |
| Total % | 3.7% | 46.9% | 0.7% | 0.0% | 51.4% | 3.5% | 0.0% | 3.6% | 0.1% | 7.3% | 0.6% | 37.4% | 1.8% | 0.0% | 39.9% | 0.5% | 0.0% | 0.7% | 0.2% | 1.4% | 100.0% | |

| **AM PEAK HOUR** | Sunol Blvd Southbound | | | | | Sycamore Rd Westbound | | | | | Sunol Blvd Northbound | | | | | Sycamore Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:45 to 08:45 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:45 | | | | | | | | | | | | | | | | | | | | | |
| 7:45 | 19 | 324 | 5 | 0 | 348 | 21 | 0 | 24 | 2 | 47 | 8 | 101 | 8 | 0 | 117 | 0 | 0 | 0 | 1 | 1 | 513 |
| 8:00 | 25 | 392 | 7 | 0 | 424 | 19 | 0 | 43 | 1 | 63 | 6 | 108 | 7 | 0 | 121 | 2 | 0 | 1 | 0 | 3 | 611 |
| 8:15 | 40 | 364 | 3 | 0 | 407 | 18 | 0 | 20 | 0 | 38 | 6 | 90 | 8 | 0 | 104 | 0 | 0 | 1 | 0 | 1 | 550 |
| 8:30 | 29 | 359 | 6 | 0 | 394 | 12 | 0 | 10 | 2 | 24 | 8 | 115 | 3 | 0 | 126 | 0 | 0 | 1 | 2 | 3 | 547 |
| Total Volume | 113 | 1439 | 21 | 0 | 1573 | 70 | 0 | 97 | 5 | 172 | 28 | 414 | 26 | 0 | 468 | 2 | 0 | 3 | 3 | 8 | 2221 |
| % App Total | 7.2% | 91.5% | 1.3% | 0.0% | | 40.7% | 0.0% | 56.4% | 2.9% | | 6.0% | 88.5% | 5.6% | 0.0% | | 25.0% | 0.0% | 37.5% | 37.5% | | |
| PHF | .706 | .918 | .750 | .000 | .927 | .833 | .000 | .564 | .625 | .683 | .875 | .900 | .813 | .000 | .929 | .250 | .000 | .750 | .375 | .667 | .909 |

| **PM PEAK HOUR** | Sunol Blvd Southbound | | | | | Sycamore Rd Westbound | | | | | Sunol Blvd Northbound | | | | | Sycamore Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 17 | 119 | 2 | 0 | 138 | 16 | 0 | 17 | 0 | 33 | 2 | 272 | 16 | 0 | 290 | 7 | 0 | 14 | 0 | 21 | 482 |
| 17:15 | 16 | 144 | 4 | 0 | 164 | 10 | 0 | 13 | 2 | 25 | 1 | 293 | 5 | 0 | 299 | 3 | 0 | 5 | 3 | 11 | 499 |
| 17:30 | 17 | 106 | 3 | 0 | 126 | 6 | 0 | 18 | 0 | 24 | 0 | 286 | 15 | 0 | 301 | 4 | 0 | 4 | 1 | 9 | 460 |
| 17:45 | 17 | 122 | 4 | 0 | 143 | 16 | 0 | 25 | 1 | 42 | 0 | 340 | 21 | 0 | 361 | 2 | 0 | 4 | 0 | 6 | 552 |
| Total Volume | 67 | 491 | 13 | 0 | 571 | 48 | 0 | 73 | 3 | 124 | 3 | 1191 | 57 | 0 | 1251 | 16 | 0 | 27 | 4 | 47 | 1993 |
| % App Total | 11.7% | 86.0% | 2.3% | 0.0% | | 38.7% | 0.0% | 58.9% | 2.4% | | 0.2% | 95.2% | 4.6% | 0.0% | | 34.0% | 0.0% | 57.4% | 8.5% | | |
| PHF | .985 | .852 | .813 | .000 | .870 | .750 | .000 | .730 | .375 | .738 | .375 | .876 | .679 | .000 | .866 | .571 | .000 | .482 | .333 | .560 | .903 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-002 Sunol Blvd & Arlington Dr
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Sunol Blvd Southbound | | | | | Arlington Dr Westbound | | | | | Sunol Blvd Northbound | | | | | Arlington Dr Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 2 | 351 | 1 | 0 | 354 | 11 | 0 | 2 | 0 | 13 | 6 | 61 | 1 | 0 | 68 | 0 | 0 | 0 | 0 | 0 | 435 | 0 |
| 7:15 | 5 | 398 | 0 | 1 | 404 | 8 | 0 | 8 | 0 | 16 | 5 | 77 | 7 | 0 | 89 | 0 | 0 | 1 | 0 | 1 | 510 | 1 |
| 7:30 | 7 | 413 | 0 | 0 | 420 | 6 | 0 | 7 | 0 | 13 | 5 | 79 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 517 | 0 |
| 7:45 | 1 | 342 | 0 | 2 | 345 | 6 | 0 | 13 | 0 | 19 | 5 | 106 | 0 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 475 | 2 |
| Total | 15 | 1504 | 1 | 3 | 1523 | 31 | 0 | 30 | 0 | 61 | 21 | 323 | 8 | 0 | 352 | 0 | 0 | 1 | 0 | 1 | 1937 | 3 |
| 8:00 | 7 | 401 | 1 | 1 | 410 | 9 | 0 | 8 | 0 | 17 | 6 | 106 | 6 | 1 | 119 | 0 | 0 | 1 | 0 | 1 | 547 | 2 |
| 8:15 | 12 | 376 | 0 | 3 | 391 | 4 | 0 | 11 | 0 | 15 | 5 | 93 | 1 | 3 | 102 | 0 | 0 | 1 | 0 | 1 | 509 | 6 |
| 8:30 | 7 | 365 | 0 | 0 | 372 | 0 | 0 | 6 | 0 | 6 | 6 | 118 | 1 | 0 | 125 | 0 | 0 | 1 | 0 | 1 | 504 | 0 |
| 8:45 | 3 | 302 | 3 | 2 | 310 | 7 | 0 | 4 | 0 | 11 | 11 | 113 | 1 | 2 | 127 | 0 | 0 | 0 | 0 | 0 | 448 | 4 |
| Total | 29 | 1444 | 4 | 6 | 1483 | 20 | 0 | 29 | 0 | 49 | 28 | 430 | 9 | 6 | 473 | 0 | 0 | 3 | 0 | 3 | 2008 | 12 |
| 16:00 | 7 | 123 | 0 | 0 | 130 | 1 | 0 | 5 | 0 | 6 | 0 | 289 | 4 | 0 | 293 | 0 | 0 | 9 | 0 | 9 | 438 | 0 |
| 16:15 | 5 | 142 | 0 | 0 | 147 | 2 | 0 | 7 | 0 | 9 | 0 | 292 | 4 | 0 | 296 | 1 | 0 | 11 | 0 | 12 | 464 | 0 |
| 16:30 | 9 | 133 | 0 | 0 | 142 | 4 | 0 | 4 | 0 | 8 | 1 | 253 | 10 | 0 | 264 | 0 | 0 | 8 | 0 | 8 | 422 | 0 |
| 16:45 | 2 | 144 | 0 | 0 | 146 | 5 | 0 | 8 | 0 | 13 | 0 | 280 | 3 | 0 | 283 | 1 | 0 | 13 | 0 | 14 | 456 | 0 |
| Total | 23 | 542 | 0 | 0 | 565 | 12 | 0 | 24 | 0 | 36 | 1 | 1114 | 21 | 0 | 1136 | 2 | 0 | 41 | 0 | 43 | 1780 | 0 |
| 17:00 | 11 | 134 | 0 | 1 | 146 | 9 | 0 | 5 | 0 | 14 | 1 | 289 | 6 | 0 | 296 | 1 | 0 | 23 | 0 | 24 | 480 | 1 |
| 17:15 | 9 | 155 | 0 | 1 | 165 | 3 | 0 | 8 | 0 | 11 | 0 | 296 | 8 | 1 | 305 | 0 | 0 | 13 | 0 | 13 | 494 | 2 |
| 17:30 | 3 | 110 | 1 | 2 | 116 | 6 | 0 | 10 | 0 | 16 | 0 | 281 | 10 | 0 | 291 | 1 | 0 | 6 | 0 | 7 | 430 | 2 |
| 17:45 | 7 | 133 | 1 | 0 | 141 | 2 | 0 | 8 | 0 | 10 | 1 | 342 | 5 | 0 | 348 | 0 | 0 | 4 | 0 | 4 | 503 | 0 |
| Total | 30 | 532 | 2 | 4 | 568 | 20 | 0 | 31 | 0 | 51 | 2 | 1208 | 29 | 1 | 1240 | 2 | 0 | 46 | 0 | 48 | 1907 | 5 |
| Grand Total | 97 | 4022 | 7 | 13 | 4139 | 83 | 0 | 114 | 0 | 197 | 52 | 3075 | 67 | 7 | 3201 | 4 | 0 | 91 | 0 | 95 | 7632 | 20 |
| Apprch % | 2.3% | 97.2% | 0.2% | 0.3% | | 42.1% | 0.0% | 57.9% | 0.0% | | 1.6% | 96.1% | 2.1% | 0.2% | | 4.2% | 0.0% | 95.8% | 0.0% | | | |
| Total % | 1.3% | 52.7% | 0.1% | 0.2% | 54.2% | 1.1% | 0.0% | 1.5% | 0.0% | 2.6% | 0.7% | 40.3% | 0.9% | 0.1% | 41.9% | 0.1% | 0.0% | 1.2% | 0.0% | 1.2% | 100.0% | |

| **AM PEAK HOUR** | Sunol Blvd Southbound | | | | | Arlington Dr Westbound | | | | | Sunol Blvd Northbound | | | | | Arlington Dr Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:15 to 08:15 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:15 | | | | | | | | | | | | | | | | | | | | | |
| 7:15 | 5 | 398 | 0 | 1 | 404 | 8 | 0 | 8 | 0 | 16 | 5 | 77 | 7 | 0 | 89 | 0 | 0 | 1 | 0 | 1 | 510 |
| 7:30 | 7 | 413 | 0 | 0 | 420 | 6 | 0 | 7 | 0 | 13 | 5 | 79 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 517 |
| 7:45 | 1 | 342 | 0 | 2 | 345 | 6 | 0 | 13 | 0 | 19 | 5 | 106 | 0 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 475 |
| 8:00 | 7 | 401 | 1 | 1 | 410 | 9 | 0 | 8 | 0 | 17 | 6 | 106 | 6 | 1 | 119 | 0 | 0 | 1 | 0 | 1 | 547 |
| Total Volume | 20 | 1554 | 1 | 4 | 1579 | 29 | 0 | 36 | 0 | 65 | 21 | 368 | 13 | 1 | 403 | 0 | 0 | 2 | 0 | 2 | 2049 |
| % App Total | 1.3% | 98.4% | 0.1% | 0.3% | | 44.6% | 0.0% | 55.4% | 0.0% | | 5.2% | 91.3% | 3.2% | 0.2% | | 0.0% | 0.0% | 100.0% | 0.0% | | |
| PHF | .714 | .941 | .250 | .500 | .940 | .806 | .000 | .692 | .000 | .855 | .875 | .868 | .464 | .250 | .847 | .000 | .000 | .500 | .000 | .500 | .936 |

| **PM PEAK HOUR** | Sunol Blvd Southbound | | | | | Arlington Dr Westbound | | | | | Sunol Blvd Northbound | | | | | Arlington Dr Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 11 | 134 | 0 | 1 | 146 | 9 | 0 | 5 | 0 | 14 | 1 | 289 | 6 | 0 | 296 | 1 | 0 | 23 | 0 | 24 | 480 |
| 17:15 | 9 | 155 | 0 | 1 | 165 | 3 | 0 | 8 | 0 | 11 | 0 | 296 | 8 | 1 | 305 | 0 | 0 | 13 | 0 | 13 | 494 |
| 17:30 | 3 | 110 | 1 | 2 | 116 | 6 | 0 | 10 | 0 | 16 | 0 | 281 | 10 | 0 | 291 | 1 | 0 | 6 | 0 | 7 | 430 |
| 17:45 | 7 | 133 | 1 | 0 | 141 | 2 | 0 | 8 | 0 | 10 | 1 | 342 | 5 | 0 | 348 | 0 | 0 | 4 | 0 | 4 | 503 |
| Total Volume | 30 | 532 | 2 | 4 | 568 | 20 | 0 | 31 | 0 | 51 | 2 | 1208 | 29 | 1 | 1240 | 2 | 0 | 46 | 0 | 48 | 1907 |
| % App Total | 5.3% | 93.7% | 0.4% | 0.7% | | 39.2% | 0.0% | 60.8% | 0.0% | | 0.2% | 97.4% | 2.3% | 0.1% | | 4.2% | 0.0% | 95.8% | 0.0% | | |
| PHF | .682 | .858 | .500 | .500 | .861 | .556 | .000 | .775 | .000 | .797 | .500 | .883 | .725 | .250 | .891 | .500 | .000 | .500 | .000 | .500 | .948 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-003 Riddell St & Sunol Blvd
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Riddell St Southbound | | | | | Sunol Blvd Westbound | | | | | Riddell St Northbound | | | | | Sunol Blvd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 366 | 0 | 0 | 366 | 0 | 0 | 1 | 0 | 1 | 0 | 68 | 0 | 0 | 68 | 435 | 0 |
| 7:15 | 0 | 0 | 0 | 0 | 0 | 1 | 405 | 0 | 0 | 406 | 0 | 0 | 2 | 0 | 2 | 0 | 84 | 3 | 0 | 87 | 495 | 0 |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 428 | 0 | 0 | 428 | 0 | 0 | 6 | 0 | 6 | 0 | 78 | 0 | 0 | 78 | 512 | 0 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 348 | 0 | 0 | 348 | 0 | 0 | 8 | 0 | 8 | 0 | 108 | 2 | 0 | 110 | 466 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 1547 | 0 | 0 | 1548 | 0 | 0 | 17 | 0 | 17 | 0 | 338 | 5 | 0 | 343 | 1908 | 0 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 1 | 410 | 0 | 0 | 411 | 0 | 0 | 3 | 0 | 3 | 0 | 112 | 1 | 0 | 113 | 527 | 0 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 2 | 390 | 0 | 0 | 392 | 0 | 0 | 3 | 0 | 3 | 0 | 100 | 1 | 0 | 101 | 496 | 0 |
| 8:30 | 0 | 0 | 0 | 0 | 0 | 2 | 364 | 0 | 0 | 366 | 0 | 0 | 2 | 0 | 2 | 0 | 121 | 2 | 0 | 123 | 491 | 0 |
| 8:45 | 0 | 0 | 0 | 0 | 0 | 0 | 301 | 0 | 0 | 301 | 0 | 0 | 6 | 0 | 6 | 0 | 125 | 2 | 0 | 127 | 434 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 5 | 1465 | 0 | 0 | 1470 | 0 | 0 | 14 | 0 | 14 | 0 | 458 | 6 | 0 | 464 | 1948 | 0 |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 1 | 141 | 0 | 0 | 142 | 0 | 0 | 2 | 0 | 2 | 0 | 293 | 0 | 0 | 293 | 437 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 1 | 151 | 0 | 0 | 152 | 0 | 0 | 4 | 0 | 4 | 0 | 288 | 2 | 0 | 290 | 446 | 0 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 5 | 145 | 0 | 0 | 150 | 0 | 0 | 1 | 0 | 1 | 0 | 263 | 0 | 0 | 263 | 414 | 0 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 4 | 156 | 0 | 0 | 160 | 0 | 0 | 4 | 0 | 4 | 0 | 288 | 4 | 0 | 292 | 456 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 11 | 593 | 0 | 0 | 604 | 0 | 0 | 11 | 0 | 11 | 0 | 1132 | 6 | 0 | 1138 | 1753 | 0 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 5 | 163 | 0 | 0 | 168 | 0 | 0 | 5 | 0 | 5 | 0 | 282 | 2 | 0 | 284 | 457 | 0 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 8 | 157 | 0 | 0 | 165 | 0 | 0 | 1 | 0 | 1 | 0 | 304 | 2 | 0 | 306 | 472 | 0 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 7 | 122 | 0 | 0 | 129 | 0 | 0 | 5 | 0 | 5 | 0 | 290 | 2 | 0 | 292 | 426 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 4 | 132 | 0 | 0 | 136 | 0 | 0 | 4 | 0 | 4 | 0 | 341 | 5 | 0 | 346 | 486 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 24 | 574 | 0 | 0 | 598 | 0 | 0 | 15 | 0 | 15 | 0 | 1217 | 11 | 0 | 1228 | 1841 | 0 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 41 | 4179 | 0 | 0 | 4220 | 0 | 0 | 57 | 0 | 57 | 0 | 3145 | 28 | 0 | 3173 | 7450 | 0 |
| Apprch % | 0.0% | 0.0% | 0.0% | 0.0% | | 1.0% | 99.0% | 0.0% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 99.1% | 0.9% | 0.0% | | | |
| Total % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.6% | 56.1% | 0.0% | 0.0% | 56.6% | 0.0% | 0.0% | 0.8% | 0.0% | 0.8% | 0.0% | 42.2% | 0.4% | 0.0% | 42.6% | 100.0% | |

| **AM PEAK HOUR** | Riddell St Southbound | | | | | Sunol Blvd Westbound | | | | | Riddell St Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 428 | 0 | 0 | 428 | 0 | 0 | 6 | 0 | 6 | 0 | 78 | 0 | 0 | 78 | 512 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 348 | 0 | 0 | 348 | 0 | 0 | 8 | 0 | 8 | 0 | 108 | 2 | 0 | 110 | 466 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 1 | 410 | 0 | 0 | 411 | 0 | 0 | 3 | 0 | 3 | 0 | 112 | 1 | 0 | 113 | 527 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 2 | 390 | 0 | 0 | 392 | 0 | 0 | 3 | 0 | 3 | 0 | 100 | 1 | 0 | 101 | 496 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 3 | 1576 | 0 | 0 | 1579 | 0 | 0 | 20 | 0 | 20 | 0 | 398 | 4 | 0 | 402 | 2001 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 0.2% | 99.8% | 0.0% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 99.0% | 1.0% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .375 | .921 | .000 | .000 | .922 | .000 | .000 | .625 | .000 | .625 | .000 | .888 | .500 | .000 | .889 | .949 |

| **PM PEAK HOUR** | Riddell St Southbound | | | | | Sunol Blvd Westbound | | | | | Riddell St Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 5 | 163 | 0 | 0 | 168 | 0 | 0 | 5 | 0 | 5 | 0 | 282 | 2 | 0 | 284 | 457 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 8 | 157 | 0 | 0 | 165 | 0 | 0 | 1 | 0 | 1 | 0 | 304 | 2 | 0 | 306 | 472 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 7 | 122 | 0 | 0 | 129 | 0 | 0 | 5 | 0 | 5 | 0 | 290 | 2 | 0 | 292 | 426 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 4 | 132 | 0 | 0 | 136 | 0 | 0 | 4 | 0 | 4 | 0 | 341 | 5 | 0 | 346 | 486 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 24 | 574 | 0 | 0 | 598 | 0 | 0 | 15 | 0 | 15 | 0 | 1217 | 11 | 0 | 1228 | 1841 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 4.0% | 96.0% | 0.0% | 0.0% | | 0.0% | 0.0% | 100.0% | 0.0% | | 0.0% | 99.1% | 0.9% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .750 | .880 | .000 | .000 | .890 | .000 | .000 | .750 | .000 | .750 | .000 | .892 | .550 | .000 | .887 | .947 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-004 I-680 NB Ramps & Sunol Blvd
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | I-680 NB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 NB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 322 | 42 | 0 | 364 | 1 | 0 | 53 | 0 | 54 | 13 | 19 | 0 | 0 | 32 | 450 | 0 |
| 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 362 | 46 | 0 | 408 | 4 | 1 | 60 | 0 | 65 | 19 | 25 | 0 | 0 | 44 | 517 | 0 |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 363 | 55 | 0 | 418 | 2 | 1 | 50 | 0 | 53 | 23 | 29 | 0 | 0 | 52 | 523 | 0 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 314 | 46 | 0 | 360 | 5 | 0 | 66 | 0 | 71 | 26 | 42 | 0 | 0 | 68 | 499 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 1361 | 189 | 0 | 1550 | 12 | 2 | 229 | 0 | 243 | 81 | 115 | 0 | 0 | 196 | 1989 | 0 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 369 | 37 | 0 | 406 | 5 | 0 | 55 | 0 | 60 | 23 | 62 | 0 | 0 | 85 | 551 | 0 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 0 | 346 | 48 | 0 | 394 | 5 | 0 | 56 | 0 | 61 | 23 | 41 | 0 | 0 | 64 | 519 | 0 |
| 8:30 | 0 | 0 | 0 | 0 | 0 | 0 | 329 | 29 | 0 | 358 | 4 | 0 | 79 | 0 | 83 | 30 | 44 | 0 | 0 | 74 | 515 | 0 |
| 8:45 | 0 | 0 | 0 | 0 | 0 | 0 | 264 | 41 | 0 | 305 | 4 | 1 | 71 | 0 | 76 | 47 | 57 | 0 | 0 | 104 | 485 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 1308 | 155 | 0 | 1463 | 18 | 1 | 261 | 0 | 280 | 123 | 204 | 0 | 0 | 327 | 2070 | 0 |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 95 | 47 | 0 | 142 | 3 | 0 | 168 | 0 | 171 | 58 | 134 | 0 | 0 | 192 | 505 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 0 | 103 | 48 | 0 | 151 | 2 | 0 | 139 | 0 | 141 | 66 | 145 | 0 | 0 | 211 | 503 | 0 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 104 | 41 | 0 | 145 | 2 | 0 | 129 | 0 | 131 | 77 | 142 | 0 | 0 | 219 | 495 | 0 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 114 | 41 | 0 | 155 | 10 | 0 | 151 | 0 | 161 | 67 | 133 | 0 | 0 | 200 | 516 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 416 | 177 | 0 | 593 | 17 | 0 | 587 | 0 | 604 | 268 | 554 | 0 | 0 | 822 | 2019 | 0 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 55 | 0 | 164 | 2 | 0 | 142 | 0 | 144 | 69 | 143 | 0 | 0 | 212 | 520 | 0 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 | 102 | 55 | 0 | 157 | 5 | 0 | 170 | 0 | 175 | 62 | 132 | 0 | 0 | 194 | 526 | 0 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 40 | 0 | 120 | 6 | 1 | 156 | 0 | 163 | 83 | 139 | 0 | 0 | 222 | 505 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 55 | 0 | 134 | 6 | 1 | 196 | 0 | 203 | 70 | 144 | 0 | 0 | 214 | 551 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 370 | 205 | 0 | 575 | 19 | 2 | 664 | 0 | 685 | 284 | 558 | 0 | 0 | 842 | 2102 | 0 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 0 | 3455 | 726 | 0 | 4181 | 66 | 5 | 1741 | 0 | 1812 | 756 | 1431 | 0 | 0 | 2187 | 8180 | 0 |
| Apprch % | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 82.6% | 17.4% | 0.0% | | 3.6% | 0.3% | 96.1% | 0.0% | | 34.6% | 65.4% | 0.0% | 0.0% | | | |
| Total % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 42.2% | 8.9% | 0.0% | 51.1% | 0.8% | 0.1% | 21.3% | 0.0% | 22.2% | 9.2% | 17.5% | 0.0% | 0.0% | 26.7% | 100.0% | |

| **AM PEAK HOUR** | I-680 NB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 NB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 363 | 55 | 0 | 418 | 2 | 1 | 50 | 0 | 53 | 23 | 29 | 0 | 0 | 52 | 523 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 314 | 46 | 0 | 360 | 5 | 0 | 66 | 0 | 71 | 26 | 42 | 0 | 0 | 68 | 499 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 369 | 37 | 0 | 406 | 5 | 0 | 55 | 0 | 60 | 23 | 62 | 0 | 0 | 85 | 551 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 0 | 346 | 48 | 0 | 394 | 5 | 0 | 56 | 0 | 61 | 23 | 41 | 0 | 0 | 64 | 519 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 0 | 1392 | 186 | 0 | 1578 | 17 | 1 | 227 | 0 | 245 | 95 | 174 | 0 | 0 | 269 | 2092 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 88.2% | 11.8% | 0.0% | | 6.9% | 0.4% | 92.7% | 0.0% | | 35.3% | 64.7% | 0.0% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .000 | .943 | .845 | .000 | .944 | .850 | .250 | .860 | .000 | .863 | .913 | .702 | .000 | .000 | .791 | .949 |

| **PM PEAK HOUR** | I-680 NB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 NB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 109 | 55 | 0 | 164 | 2 | 0 | 142 | 0 | 144 | 69 | 143 | 0 | 0 | 212 | 520 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 | 102 | 55 | 0 | 157 | 5 | 0 | 170 | 0 | 175 | 62 | 132 | 0 | 0 | 194 | 526 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 0 | 80 | 40 | 0 | 120 | 6 | 1 | 156 | 0 | 163 | 83 | 139 | 0 | 0 | 222 | 505 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 0 | 79 | 55 | 0 | 134 | 6 | 1 | 196 | 0 | 203 | 70 | 144 | 0 | 0 | 214 | 551 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 0 | 370 | 205 | 0 | 575 | 19 | 2 | 664 | 0 | 685 | 284 | 558 | 0 | 0 | 842 | 2102 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 64.3% | 35.7% | 0.0% | | 2.8% | 0.3% | 96.9% | 0.0% | | 33.7% | 66.3% | 0.0% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .000 | .849 | .932 | .000 | .877 | .792 | .500 | .847 | .000 | .844 | .855 | .969 | .000 | .000 | .948 | .954 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-005 I-680 SB Ramps & Sunol Blvd
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | I-680 SB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 SB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 7 | 0 | 22 | 0 | 29 | 0 | 89 | 237 | 0 | 326 | 0 | 0 | 0 | 0 | 0 | 37 | 26 | 0 | 0 | 63 | 418 | 0 |
| 7:15 | 10 | 0 | 23 | 0 | 33 | 0 | 102 | 249 | 0 | 351 | 0 | 0 | 0 | 0 | 0 | 24 | 31 | 0 | 0 | 55 | 439 | 0 |
| 7:30 | 12 | 0 | 33 | 0 | 45 | 0 | 107 | 271 | 0 | 378 | 0 | 0 | 0 | 0 | 0 | 35 | 42 | 0 | 0 | 77 | 500 | 0 |
| 7:45 | 15 | 0 | 25 | 0 | 40 | 0 | 82 | 225 | 0 | 307 | 0 | 0 | 0 | 0 | 0 | 45 | 49 | 0 | 0 | 94 | 441 | 0 |
| Total | 44 | 0 | 103 | 0 | 147 | 0 | 380 | 982 | 0 | 1362 | 0 | 0 | 0 | 0 | 0 | 141 | 148 | 0 | 0 | 289 | 1798 | 0 |
| 8:00 | 23 | 0 | 41 | 2 | 66 | 0 | 123 | 258 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 36 | 62 | 0 | 0 | 98 | 545 | 2 |
| 8:15 | 13 | 0 | 25 | 0 | 38 | 0 | 103 | 241 | 0 | 344 | 0 | 0 | 0 | 0 | 0 | 22 | 51 | 0 | 0 | 73 | 455 | 0 |
| 8:30 | 18 | 0 | 26 | 0 | 44 | 0 | 96 | 245 | 0 | 341 | 0 | 0 | 0 | 0 | 0 | 35 | 57 | 0 | 0 | 92 | 477 | 0 |
| 8:45 | 33 | 0 | 27 | 1 | 61 | 0 | 79 | 180 | 0 | 259 | 0 | 0 | 0 | 0 | 0 | 36 | 70 | 0 | 0 | 106 | 426 | 1 |
| Total | 87 | 0 | 119 | 3 | 209 | 0 | 401 | 924 | 0 | 1325 | 0 | 0 | 0 | 0 | 0 | 129 | 240 | 0 | 0 | 369 | 1903 | 3 |
| 16:00 | 41 | 0 | 45 | 0 | 86 | 0 | 35 | 61 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 4 | 149 | 0 | 0 | 153 | 335 | 0 |
| 16:15 | 39 | 0 | 25 | 0 | 64 | 0 | 47 | 58 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 6 | 174 | 0 | 0 | 180 | 349 | 0 |
| 16:30 | 43 | 0 | 37 | 0 | 80 | 0 | 50 | 54 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 5 | 174 | 0 | 0 | 179 | 363 | 0 |
| 16:45 | 31 | 0 | 27 | 0 | 58 | 0 | 58 | 64 | 0 | 122 | 0 | 0 | 0 | 0 | 0 | 3 | 169 | 0 | 0 | 172 | 352 | 0 |
| Total | 154 | 0 | 134 | 0 | 288 | 0 | 190 | 237 | 0 | 427 | 0 | 0 | 0 | 0 | 0 | 18 | 666 | 0 | 0 | 684 | 1399 | 0 |
| 17:00 | 47 | 0 | 39 | 0 | 86 | 0 | 46 | 67 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 3 | 165 | 0 | 0 | 168 | 367 | 0 |
| 17:15 | 38 | 0 | 36 | 0 | 74 | 0 | 41 | 65 | 0 | 106 | 0 | 0 | 0 | 0 | 0 | 5 | 163 | 0 | 0 | 168 | 348 | 0 |
| 17:30 | 41 | 0 | 29 | 0 | 70 | 0 | 44 | 43 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 9 | 171 | 0 | 0 | 180 | 337 | 0 |
| 17:45 | 62 | 0 | 26 | 0 | 88 | 0 | 42 | 37 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 1 | 159 | 0 | 0 | 160 | 327 | 0 |
| Total | 188 | 0 | 130 | 0 | 318 | 0 | 173 | 212 | 0 | 385 | 0 | 0 | 0 | 0 | 0 | 18 | 658 | 0 | 0 | 676 | 1379 | 0 |
| Grand Total | 473 | 0 | 486 | 3 | 962 | 0 | 1144 | 2355 | 0 | 3499 | 0 | 0 | 0 | 0 | 0 | 306 | 1712 | 0 | 0 | 2018 | 6479 | 3 |
| Apprch % | 49.2% | 0.0% | 50.5% | 0.3% | | 0.0% | 32.7% | 67.3% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 15.2% | 84.8% | 0.0% | 0.0% | | | |
| Total % | 7.3% | 0.0% | 7.5% | 0.0% | 14.8% | 0.0% | 17.7% | 36.3% | 0.0% | 54.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 4.7% | 26.4% | 0.0% | 0.0% | 31.1% | 100.0% | |

| **AM PEAK HOUR** | I-680 SB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 SB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 7:30 | 12 | 0 | 33 | 0 | 45 | 0 | 107 | 271 | 0 | 378 | 0 | 0 | 0 | 0 | 0 | 35 | 42 | 0 | 0 | 77 | 500 |
| 7:45 | 15 | 0 | 25 | 0 | 40 | 0 | 82 | 225 | 0 | 307 | 0 | 0 | 0 | 0 | 0 | 45 | 49 | 0 | 0 | 94 | 441 |
| 8:00 | 23 | 0 | 41 | 2 | 66 | 0 | 123 | 258 | 0 | 381 | 0 | 0 | 0 | 0 | 0 | 36 | 62 | 0 | 0 | 98 | 545 |
| 8:15 | 13 | 0 | 25 | 0 | 38 | 0 | 103 | 241 | 0 | 344 | 0 | 0 | 0 | 0 | 0 | 22 | 51 | 0 | 0 | 73 | 455 |
| Total Volume | 63 | 0 | 124 | 2 | 189 | 0 | 415 | 995 | 0 | 1410 | 0 | 0 | 0 | 0 | 0 | 138 | 204 | 0 | 0 | 342 | 1941 |
| % App Total | 33.3% | 0.0% | 65.6% | 1.1% | | 0.0% | 29.4% | 70.6% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 40.4% | 59.6% | 0.0% | 0.0% | | |
| PHF | .685 | .000 | .756 | .250 | .716 | .000 | .843 | .918 | .000 | .925 | .000 | .000 | .000 | .000 | .000 | .767 | .823 | .000 | .000 | .872 | .890 |

| **PM PEAK HOUR** | I-680 SB Ramps Southbound | | | | | Sunol Blvd Westbound | | | | | I-680 SB Ramps Northbound | | | | | Sunol Blvd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:15 to 17:15 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:15 | | | | | | | | | | | | | | | | | | | | | |
| 16:15 | 39 | 0 | 25 | 0 | 64 | 0 | 47 | 58 | 0 | 105 | 0 | 0 | 0 | 0 | 0 | 6 | 174 | 0 | 0 | 180 | 349 |
| 16:30 | 43 | 0 | 37 | 0 | 80 | 0 | 50 | 54 | 0 | 104 | 0 | 0 | 0 | 0 | 0 | 5 | 174 | 0 | 0 | 179 | 363 |
| 16:45 | 31 | 0 | 27 | 0 | 58 | 0 | 58 | 64 | 0 | 122 | 0 | 0 | 0 | 0 | 0 | 3 | 169 | 0 | 0 | 172 | 352 |
| 17:00 | 47 | 0 | 39 | 0 | 86 | 0 | 46 | 67 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 3 | 165 | 0 | 0 | 168 | 367 |
| Total Volume | 160 | 0 | 128 | 0 | 288 | 0 | 201 | 243 | 0 | 444 | 0 | 0 | 0 | 0 | 0 | 17 | 682 | 0 | 0 | 699 | 1431 |
| % App Total | 55.6% | 0.0% | 44.4% | 0.0% | | 0.0% | 45.3% | 54.7% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 2.4% | 97.6% | 0.0% | 0.0% | | |
| PHF | .851 | .000 | .821 | .000 | .837 | .000 | .866 | .907 | .000 | .910 | .000 | .000 | .000 | .000 | .000 | .708 | .980 | .000 | .000 | .971 | .975 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-006 Sycamore Rd & Sycamore Creek Way
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Sycamore Rd Southbound | | | | | Sycamore Creek Way Westbound | | | | | Sycamore Rd Northbound | | | | | Sycamore Creek Way Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 7 | 12 | 0 | 0 | 0 | 12 | 0 | 3 | 6 | 0 | 9 | 28 | 0 |
| 7:15 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 9 | 0 | 0 | 0 | 9 | 0 | 4 | 10 | 0 | 14 | 46 | 0 |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 42 | 14 | 0 | 2 | 0 | 16 | 0 | 9 | 8 | 0 | 17 | 75 | 0 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 24 | 21 | 0 | 0 | 0 | 21 | 0 | 12 | 13 | 0 | 25 | 70 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 96 | 0 | 0 | 96 | 56 | 0 | 2 | 0 | 58 | 0 | 28 | 37 | 0 | 65 | 219 | 0 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 43 | 18 | 0 | 0 | 1 | 19 | 0 | 17 | 9 | 0 | 26 | 88 | 1 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 0 | 0 | 26 | 12 | 0 | 0 | 0 | 12 | 0 | 27 | 18 | 0 | 45 | 83 | 0 |
| 8:30 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 8 | 0 | 0 | 0 | 8 | 0 | 14 | 13 | 0 | 27 | 45 | 0 |
| 8:45 | 0 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 20 | 18 | 0 | 1 | 0 | 19 | 0 | 10 | 8 | 0 | 18 | 57 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 98 | 0 | 0 | 99 | 56 | 0 | 1 | 1 | 58 | 0 | 68 | 48 | 0 | 116 | 273 | 1 |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 15 | 0 | 0 | 0 | 15 | 0 | 16 | 13 | 0 | 29 | 67 | 0 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 0 | 0 | 17 | 12 | 0 | 0 | 0 | 12 | 0 | 23 | 7 | 0 | 30 | 59 | 0 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 17 | 30 | 0 | 0 | 0 | 30 | 0 | 17 | 15 | 0 | 32 | 79 | 0 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 14 | 6 | 0 | 0 | 0 | 6 | 0 | 12 | 12 | 0 | 24 | 44 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 70 | 0 | 0 | 71 | 63 | 0 | 0 | 0 | 63 | 0 | 68 | 47 | 0 | 115 | 249 | 0 |
| 17:00 | 0 | 0 | 0 | 0 | 0 | 0 | 19 | 0 | 0 | 19 | 8 | 0 | 0 | 0 | 8 | 0 | 16 | 20 | 0 | 36 | 63 | 0 |
| 17:15 | 0 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 13 | 14 | 0 | 0 | 0 | 14 | 0 | 11 | 9 | 0 | 20 | 47 | 0 |
| 17:30 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 12 | 8 | 0 | 0 | 0 | 8 | 0 | 20 | 7 | 0 | 27 | 47 | 0 |
| 17:45 | 0 | 0 | 0 | 0 | 0 | 1 | 17 | 0 | 0 | 18 | 25 | 0 | 0 | 0 | 25 | 0 | 26 | 10 | 0 | 36 | 79 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 1 | 61 | 0 | 0 | 62 | 55 | 0 | 0 | 0 | 55 | 0 | 73 | 46 | 0 | 119 | 236 | 0 |
| Grand Total | 0 | 0 | 0 | 0 | 0 | 3 | 325 | 0 | 0 | 328 | 230 | 0 | 3 | 1 | 234 | 0 | 237 | 178 | 0 | 415 | 977 | 1 |
| Apprch % | 0.0% | 0.0% | 0.0% | 0.0% | | 0.9% | 99.1% | 0.0% | 0.0% | | 98.3% | 0.0% | 1.3% | 0.4% | | 0.0% | 57.1% | 42.9% | 0.0% | | | |
| Total % | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.3% | 33.3% | 0.0% | 0.0% | 33.6% | 23.5% | 0.0% | 0.3% | 0.1% | 24.0% | 0.0% | 24.3% | 18.2% | 0.0% | 42.5% | 100.0% | |

| **AM PEAK HOUR** | Sycamore Rd Southbound | | | | | Sycamore Creek Way Westbound | | | | | Sycamore Rd Northbound | | | | | Sycamore Creek Way Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:30 to 08:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:30 | | | | | | | | | | | | | | | | | | | | | |
| 7:30 | 0 | 0 | 0 | 0 | 0 | 0 | 42 | 0 | 0 | 42 | 14 | 0 | 2 | 0 | 16 | 0 | 9 | 8 | 0 | 17 | 75 |
| 7:45 | 0 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 24 | 21 | 0 | 0 | 0 | 21 | 0 | 12 | 13 | 0 | 25 | 70 |
| 8:00 | 0 | 0 | 0 | 0 | 0 | 0 | 43 | 0 | 0 | 43 | 18 | 0 | 0 | 1 | 19 | 0 | 17 | 9 | 0 | 26 | 88 |
| 8:15 | 0 | 0 | 0 | 0 | 0 | 1 | 25 | 0 | 0 | 26 | 12 | 0 | 0 | 0 | 12 | 0 | 27 | 18 | 0 | 45 | 83 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 1 | 134 | 0 | 0 | 135 | 65 | 0 | 2 | 1 | 68 | 0 | 65 | 48 | 0 | 113 | 316 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 0.7% | 99.3% | 0.0% | 0.0% | | 95.6% | 0.0% | 2.9% | 1.5% | | 0.0% | 57.5% | 42.5% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .779 | .000 | .000 | .785 | .774 | .000 | .250 | .250 | .810 | .000 | .602 | .667 | .000 | .628 | .898 |

| **PM PEAK HOUR** | Sycamore Rd Southbound | | | | | Sycamore Creek Way Westbound | | | | | Sycamore Rd Northbound | | | | | Sycamore Creek Way Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:00 to 17:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:00 | | | | | | | | | | | | | | | | | | | | | |
| 16:00 | 0 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 23 | 15 | 0 | 0 | 0 | 15 | 0 | 16 | 13 | 0 | 29 | 67 |
| 16:15 | 0 | 0 | 0 | 0 | 0 | 1 | 16 | 0 | 0 | 17 | 12 | 0 | 0 | 0 | 12 | 0 | 23 | 7 | 0 | 30 | 59 |
| 16:30 | 0 | 0 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 17 | 30 | 0 | 0 | 0 | 30 | 0 | 17 | 15 | 0 | 32 | 79 |
| 16:45 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 0 | 0 | 14 | 6 | 0 | 0 | 0 | 6 | 0 | 12 | 12 | 0 | 24 | 44 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 1 | 70 | 0 | 0 | 71 | 63 | 0 | 0 | 0 | 63 | 0 | 68 | 47 | 0 | 115 | 249 |
| % App Total | 0.0% | 0.0% | 0.0% | 0.0% | | 1.4% | 98.6% | 0.0% | 0.0% | | 100.0% | 0.0% | 0.0% | 0.0% | | 0.0% | 59.1% | 40.9% | 0.0% | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .250 | .761 | .000 | .000 | .772 | .525 | .000 | .000 | .000 | .525 | .000 | .739 | .783 | .000 | .898 | .788 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-007 Pleasanton Sunol Rd & Happy Valley Rd
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Pleasanton Sunol Rd Southbound | | | | | Happy Valley Rd Westbound | | | | | Pleasanton Sunol Rd Northbound | | | | | Happy Valley Rd Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 9 | 99 | 0 | 0 | 108 | 0 | 0 | 7 | 0 | 7 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 121 | 0 |
| 7:15 | 7 | 116 | 0 | 0 | 123 | 3 | 0 | 12 | 0 | 15 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 148 | 0 |
| 7:30 | 9 | 123 | 0 | 0 | 132 | 3 | 0 | 16 | 0 | 19 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 166 | 0 |
| 7:45 | 7 | 90 | 0 | 0 | 97 | 1 | 0 | 15 | 0 | 16 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 123 | 0 |
| Total | 32 | 428 | 0 | 0 | 460 | 7 | 0 | 50 | 0 | 57 | 0 | 40 | 1 | 0 | 41 | 0 | 0 | 0 | 0 | 0 | 558 | 0 |
| 8:00 | 10 | 117 | 0 | 0 | 127 | 2 | 0 | 6 | 0 | 8 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 147 | 0 |
| 8:15 | 6 | 100 | 0 | 0 | 106 | 1 | 0 | 2 | 0 | 3 | 0 | 7 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 116 | 0 |
| 8:30 | 4 | 98 | 0 | 0 | 102 | 1 | 0 | 7 | 0 | 8 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 120 | 0 |
| 8:45 | 4 | 88 | 0 | 0 | 92 | 2 | 0 | 8 | 0 | 10 | 0 | 13 | 2 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 117 | 0 |
| Total | 24 | 403 | 0 | 0 | 427 | 6 | 0 | 23 | 0 | 29 | 0 | 41 | 3 | 0 | 44 | 0 | 0 | 0 | 0 | 0 | 500 | 0 |
| 16:00 | 13 | 26 | 0 | 0 | 39 | 0 | 0 | 4 | 0 | 4 | 0 | 25 | 1 | 0 | 26 | 0 | 0 | 0 | 0 | 0 | 69 | 0 |
| 16:15 | 7 | 35 | 0 | 0 | 42 | 1 | 0 | 3 | 0 | 4 | 0 | 31 | 1 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 78 | 0 |
| 16:30 | 9 | 35 | 0 | 0 | 44 | 1 | 0 | 11 | 0 | 12 | 0 | 25 | 2 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 83 | 0 |
| 16:45 | 3 | 30 | 0 | 0 | 33 | 2 | 0 | 6 | 0 | 8 | 0 | 33 | 1 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 75 | 0 |
| Total | 32 | 126 | 0 | 0 | 158 | 4 | 0 | 24 | 0 | 28 | 0 | 114 | 5 | 0 | 119 | 0 | 0 | 0 | 0 | 0 | 305 | 0 |
| 17:00 | 8 | 36 | 0 | 0 | 44 | 0 | 0 | 4 | 0 | 4 | 0 | 22 | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 71 | 0 |
| 17:15 | 10 | 38 | 0 | 0 | 48 | 0 | 0 | 7 | 0 | 7 | 0 | 26 | 1 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 82 | 0 |
| 17:30 | 15 | 31 | 0 | 0 | 46 | 0 | 0 | 3 | 0 | 3 | 0 | 33 | 1 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 83 | 0 |
| 17:45 | 4 | 24 | 0 | 0 | 28 | 1 | 0 | 9 | 0 | 10 | 0 | 27 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 65 | 0 |
| Total | 37 | 129 | 0 | 0 | 166 | 1 | 0 | 23 | 0 | 24 | 0 | 108 | 3 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 301 | 0 |
| Grand Total | 125 | 1086 | 0 | 0 | 1211 | 18 | 0 | 120 | 0 | 138 | 0 | 303 | 12 | 0 | 315 | 0 | 0 | 0 | 0 | 0 | 1664 | 0 |
| Apprch % | 10.3% | 89.7% | 0.0% | 0.0% | | 13.0% | 0.0% | 87.0% | 0.0% | | 0.0% | 96.2% | 3.8% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| Total % | 7.5% | 65.3% | 0.0% | 0.0% | 72.8% | 1.1% | 0.0% | 7.2% | 0.0% | 8.3% | 0.0% | 18.2% | 0.7% | 0.0% | 18.9% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 100.0% | |

| **AM PEAK HOUR** | Pleasanton Sunol Rd Southbound | | | | | Happy Valley Rd Westbound | | | | | Pleasanton Sunol Rd Northbound | | | | | Happy Valley Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 07:15 to 08:15 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 07:15 | | | | | | | | | | | | | | | | | | | | | |
| 7:15 | 7 | 116 | 0 | 0 | 123 | 3 | 0 | 12 | 0 | 15 | 0 | 9 | 1 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 148 |
| 7:30 | 9 | 123 | 0 | 0 | 132 | 3 | 0 | 16 | 0 | 19 | 0 | 15 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0 | 166 |
| 7:45 | 7 | 90 | 0 | 0 | 97 | 1 | 0 | 15 | 0 | 16 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 123 |
| 8:00 | 10 | 117 | 0 | 0 | 127 | 2 | 0 | 6 | 0 | 8 | 0 | 12 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 147 |
| Total Volume | 33 | 446 | 0 | 0 | 479 | 9 | 0 | 49 | 0 | 58 | 0 | 46 | 1 | 0 | 47 | 0 | 0 | 0 | 0 | 0 | 584 |
| % App Total | 6.9% | 93.1% | 0.0% | 0.0% | | 15.5% | 0.0% | 84.5% | 0.0% | | 0.0% | 97.9% | 2.1% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .825 | .907 | .000 | .000 | .907 | .750 | .000 | .766 | .000 | .763 | .000 | .767 | .250 | .000 | .783 | .000 | .000 | .000 | .000 | .000 | .880 |

| **PM PEAK HOUR** | Pleasanton Sunol Rd Southbound | | | | | Happy Valley Rd Westbound | | | | | Pleasanton Sunol Rd Northbound | | | | | Happy Valley Rd Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 16:30 to 17:30 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 16:30 | | | | | | | | | | | | | | | | | | | | | |
| 16:30 | 9 | 35 | 0 | 0 | 44 | 1 | 0 | 11 | 0 | 12 | 0 | 25 | 2 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 83 |
| 16:45 | 3 | 30 | 0 | 0 | 33 | 2 | 0 | 6 | 0 | 8 | 0 | 33 | 1 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 75 |
| 17:00 | 8 | 36 | 0 | 0 | 44 | 0 | 0 | 4 | 0 | 4 | 0 | 22 | 1 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 71 |
| 17:15 | 10 | 38 | 0 | 0 | 48 | 0 | 0 | 7 | 0 | 7 | 0 | 26 | 1 | 0 | 27 | 0 | 0 | 0 | 0 | 0 | 82 |
| Total Volume | 30 | 139 | 0 | 0 | 169 | 3 | 0 | 28 | 0 | 31 | 0 | 106 | 5 | 0 | 111 | 0 | 0 | 0 | 0 | 0 | 311 |
| % App Total | 17.8% | 82.2% | 0.0% | 0.0% | | 9.7% | 0.0% | 90.3% | 0.0% | | 0.0% | 95.5% | 4.5% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | |
| PHF | .750 | .914 | .000 | .000 | .880 | .375 | .000 | .636 | .000 | .646 | .000 | .803 | .625 | .000 | .816 | .000 | .000 | .000 | .000 | .000 | .937 |

# National Data and Surveying Services

City of Pleasanton
All Vehicles & Uturns On Unshifted
Bikes & Peds On Bank 1
Nothing On Bank 2

**(323) 782-0090**
info@ndsdata.com

File Name : 17-7211-008 Alisal St & Happy Valley Rd/Westbridge Ln
Date : 3/16/2017

**Unshifted Count = All Vehicles & Uturns**

| | Alisal St Southbound | | | | | Happy Valley Rd/Westbridge Ln Westbound | | | | | Alisal St Northbound | | | | | Happy Valley Rd/Westbridge Ln Eastbound | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total | Uturns Total |
| 7:00 | 2 | 0 | 2 | 0 | 4 | 0 | 2 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 17 | 0 |
| 7:15 | 5 | 0 | 3 | 0 | 8 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 7 | 17 | 0 |
| 7:30 | 0 | 0 | 4 | 0 | 4 | 0 | 6 | 3 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 15 | 0 |
| 7:45 | 1 | 0 | 2 | 0 | 3 | 0 | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 6 | 15 | 0 |
| Total | 8 | 0 | 11 | 0 | 19 | 0 | 12 | 9 | 0 | 21 | 0 | 0 | 0 | 0 | 0 | 6 | 18 | 0 | 0 | 24 | 64 | 0 |
| 8:00 | 5 | 0 | 1 | 0 | 6 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 13 | 0 |
| 8:15 | 5 | 0 | 1 | 0 | 6 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 11 | 0 |
| 8:30 | 10 | 0 | 2 | 0 | 12 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 10 | 28 | 0 |
| 8:45 | 5 | 0 | 0 | 0 | 5 | 0 | 4 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 17 | 0 |
| Total | 25 | 0 | 4 | 0 | 29 | 0 | 11 | 12 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 2 | 15 | 0 | 0 | 17 | 69 | 0 |
| 16:00 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 3 | 6 | 0 | 0 | 9 | 18 | 0 |
| 16:15 | 4 | 0 | 0 | 0 | 4 | 0 | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 5 | 16 | 0 |
| 16:30 | 1 | 0 | 0 | 0 | 1 | 0 | 6 | 10 | 0 | 16 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 5 | 22 | 0 |
| 16:45 | 3 | 0 | 0 | 0 | 3 | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 9 | 0 |
| Total | 10 | 0 | 0 | 0 | 10 | 0 | 11 | 23 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 8 | 13 | 0 | 0 | 21 | 65 | 0 |
| 17:00 | 5 | 0 | 2 | 0 | 7 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 5 | 14 | 0 |
| 17:15 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 6 | 13 | 0 |
| 17:30 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 9 | 0 | 0 | 11 | 20 | 0 |
| 17:45 | 1 | 0 | 2 | 0 | 3 | 0 | 3 | 14 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 6 | 26 | 0 |
| Total | 8 | 0 | 5 | 0 | 13 | 0 | 8 | 24 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 7 | 21 | 0 | 0 | 28 | 73 | 0 |
| Grand Total | 51 | 0 | 20 | 0 | 71 | 0 | 42 | 68 | 0 | 110 | 0 | 0 | 0 | 0 | 0 | 23 | 67 | 0 | 0 | 90 | 271 | 0 |
| Apprch % | 71.8% | 0.0% | 28.2% | 0.0% | | 0.0% | 38.2% | 61.8% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 25.6% | 74.4% | 0.0% | 0.0% | | | |
| Total % | 18.8% | 0.0% | 7.4% | 0.0% | 26.2% | 0.0% | 15.5% | 25.1% | 0.0% | 40.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 8.5% | 24.7% | 0.0% | 0.0% | 33.2% | 100.0% | |

| **AM PEAK HOUR** | Alisal St Southbound | | | | | Happy Valley Rd/Westbridge Ln Westbound | | | | | Alisal St Northbound | | | | | Happy Valley Rd/Westbridge Ln Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 08:00 to 09:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 08:00 | | | | | | | | | | | | | | | | | | | | | |
| 8:00 | 5 | 0 | 1 | 0 | 6 | 0 | 3 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 13 |
| 8:15 | 5 | 0 | 1 | 0 | 6 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 2 | 11 |
| 8:30 | 10 | 0 | 2 | 0 | 12 | 0 | 4 | 2 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 10 | 28 |
| 8:45 | 5 | 0 | 0 | 0 | 5 | 0 | 4 | 5 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 3 | 17 |
| Total Volume | 25 | 0 | 4 | 0 | 29 | 0 | 11 | 12 | 0 | 23 | 0 | 0 | 0 | 0 | 0 | 2 | 15 | 0 | 0 | 17 | 69 |
| % App Total | 86.2% | 0.0% | 13.8% | 0.0% | | 0.0% | 47.8% | 52.2% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 11.8% | 88.2% | 0.0% | 0.0% | | |
| PHF | .625 | .000 | .500 | .000 | .604 | .000 | .688 | .600 | .000 | .639 | .000 | .000 | .000 | .000 | .000 | .500 | .417 | .000 | .000 | .425 | .616 |

| **PM PEAK HOUR** | Alisal St Southbound | | | | | Happy Valley Rd/Westbridge Ln Westbound | | | | | Alisal St Northbound | | | | | Happy Valley Rd/Westbridge Ln Eastbound | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| START TIME | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | LEFT | THRU | RIGHT | UTURNS | APP.TOTAL | Total |
| Peak Hour Analysis From 17:00 to 18:00 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour For Entire Intersection Begins at 17:00 | | | | | | | | | | | | | | | | | | | | | |
| 17:00 | 5 | 0 | 2 | 0 | 7 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 5 | 14 |
| 17:15 | 0 | 0 | 1 | 0 | 1 | 0 | 3 | 3 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 6 | 13 |
| 17:30 | 2 | 0 | 0 | 0 | 2 | 0 | 2 | 5 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 2 | 9 | 0 | 0 | 11 | 20 |
| 17:45 | 1 | 0 | 2 | 0 | 3 | 0 | 3 | 14 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 6 | 26 |
| Total Volume | 8 | 0 | 5 | 0 | 13 | 0 | 8 | 24 | 0 | 32 | 0 | 0 | 0 | 0 | 0 | 7 | 21 | 0 | 0 | 28 | 73 |
| % App Total | 61.5% | 0.0% | 38.5% | 0.0% | | 0.0% | 25.0% | 75.0% | 0.0% | | 0.0% | 0.0% | 0.0% | 0.0% | | 25.0% | 75.0% | 0.0% | 0.0% | | |
| PHF | .400 | .000 | .625 | .000 | .464 | .000 | .667 | .429 | .000 | .471 | .000 | .000 | .000 | .000 | .000 | .583 | .583 | .000 | .000 | .636 | .702 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Pleasanton Sunol Rd

**Day:** Thursday
**Date:** 3/30/2017

**City:** Pleasanton
**Project #:** CA17_7212_001

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 419 | 395 | 814 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 7 | | 5 | | 12 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 2 | | 6 | | 8 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 5 | | 5 | | 10 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 5 | 19 | 5 | 21 | 10 | 40 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 7 | | 8 | | 15 | |
| 01:15 | | | 1 | | 0 | | 1 | | 13:15 | | | 6 | | 4 | | 10 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 8 | | 11 | | 19 | |
| 01:45 | | | 0 | 1 | 0 | | 0 | 1 | 13:45 | | | 8 | 29 | 8 | 31 | 16 | 60 |
| 02:00 | | | 2 | | 1 | | 3 | | 14:00 | | | 12 | | 6 | | 18 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 9 | | 3 | | 12 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 14 | | 1 | | 15 | |
| 02:45 | | | 1 | 3 | 0 | 1 | 1 | 4 | 14:45 | | | 4 | 39 | 11 | 21 | 15 | 60 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 15 | | 8 | | 23 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 9 | | 3 | | 12 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 9 | | 5 | | 14 | |
| 03:45 | | | 0 | | 1 | 1 | 1 | 1 | 15:45 | | | 8 | 41 | 3 | 19 | 11 | 60 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 8 | | 4 | | 12 | |
| 04:15 | | | 2 | | 1 | | 3 | | 16:15 | | | 9 | | 4 | | 13 | |
| 04:30 | | | 1 | | 3 | | 4 | | 16:30 | | | 11 | | 5 | | 16 | |
| 04:45 | | | 1 | 4 | 2 | 6 | 3 | 10 | 16:45 | | | 11 | 39 | 6 | 19 | 17 | 58 |
| 05:00 | | | 0 | | 1 | | 1 | | 17:00 | | | 4 | | 7 | | 11 | |
| 05:15 | | | 1 | | 1 | | 2 | | 17:15 | | | 13 | | 4 | | 17 | |
| 05:30 | | | 0 | | 2 | | 2 | | 17:30 | | | 9 | | 10 | | 19 | |
| 05:45 | | | 2 | 3 | 1 | 5 | 3 | 8 | 17:45 | | | 8 | 34 | 3 | 24 | 11 | 58 |
| 06:00 | | | 0 | | 1 | | 1 | | 18:00 | | | 3 | | 7 | | 10 | |
| 06:15 | | | 2 | | 5 | | 7 | | 18:15 | | | 8 | | 14 | | 22 | |
| 06:30 | | | 4 | | 4 | | 8 | | 18:30 | | | 9 | | 4 | | 13 | |
| 06:45 | | | 4 | 10 | 13 | 23 | 17 | 33 | 18:45 | | | 10 | 30 | 5 | 30 | 15 | 60 |
| 07:00 | | | 4 | | 5 | | 9 | | 19:00 | | | 7 | | 1 | | 8 | |
| 07:15 | | | 4 | | 16 | | 20 | | 19:15 | | | 7 | | 7 | | 14 | |
| 07:30 | | | 7 | | 13 | | 20 | | 19:30 | | | 1 | | 2 | | 3 | |
| 07:45 | | | 5 | 20 | 16 | 50 | 21 | 70 | 19:45 | | | 8 | 23 | 5 | 15 | 13 | 38 |
| 08:00 | | | 12 | | 9 | | 21 | | 20:00 | | | 4 | | 4 | | 8 | |
| 08:15 | | | 4 | | 10 | | 14 | | 20:15 | | | 5 | | 6 | | 11 | |
| 08:30 | | | 3 | | 6 | | 9 | | 20:30 | | | 5 | | 0 | | 5 | |
| 08:45 | | | 2 | 21 | 7 | 32 | 9 | 53 | 20:45 | | | 1 | 15 | 2 | 12 | 3 | 27 |
| 09:00 | | | 4 | | 7 | | 11 | | 21:00 | | | 2 | | 3 | | 5 | |
| 09:15 | | | 8 | | 3 | | 11 | | 21:15 | | | 8 | | 0 | | 8 | |
| 09:30 | | | 9 | | 7 | | 16 | | 21:30 | | | 1 | | 3 | | 4 | |
| 09:45 | | | 4 | 25 | 11 | 28 | 15 | 53 | 21:45 | | | 4 | 15 | 1 | 7 | 5 | 22 |
| 10:00 | | | 6 | | 2 | | 8 | | 22:00 | | | 2 | | 5 | | 7 | |
| 10:15 | | | 5 | | 2 | | 7 | | 22:15 | | | 3 | | 2 | | 5 | |
| 10:30 | | | 5 | | 5 | | 10 | | 22:30 | | | 0 | | 0 | | 0 | |
| 10:45 | | | 6 | 22 | 10 | 19 | 16 | 41 | 22:45 | | | 1 | 6 | 1 | 8 | 2 | 14 |
| 11:00 | | | 7 | | 6 | | 13 | | 23:00 | | | 0 | | 0 | | 0 | |
| 11:15 | | | 3 | | 3 | | 6 | | 23:15 | | | 0 | | 0 | | 0 | |
| 11:30 | | | 4 | | 6 | | 10 | | 23:30 | | | 0 | | 0 | | 0 | |
| 11:45 | | | 6 | 20 | 8 | 23 | 14 | 43 | 23:45 | | | 0 | | 0 | | 0 | |
| TOTALS | | | | 129 | | 188 | | 317 | TOTALS | | | | 290 | | 207 | | 497 |
| SPLIT % | | | | 40.7% | | 59.3% | | 38.9% | SPLIT % | | | | 58.4% | | 41.6% | | 61.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 419 | 395 | 814 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:15 | 07:15 | 07:15 | PM Peak Hour | | | 13:45 | 17:30 | 13:30 |
| AM Pk Volume | | | 28 | 54 | 82 | PM Pk Volume | | | 43 | 34 | 65 |
| Pk Hr Factor | | | 0.583 | 0.844 | 0.976 | Pk Hr Factor | | | 0.768 | 0.607 | 0.855 |
| 7 - 9 Volume | 0 | 0 | 41 | 82 | 123 | 4 - 6 Volume | 0 | 0 | 73 | 43 | 116 |
| 7 - 9 Peak Hour | | | 07:15 | 07:15 | 07:15 | 4 - 6 Peak Hour | | | 16:00 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 28 | 54 | 82 | 4 - 6 Pk Volume | 0 | 0 | 39 | 27 | 64 |
| Pk Hr Factor | 0.000 | 0.000 | 0.583 | 0.844 | 0.976 | Pk Hr Factor | 0.000 | 0.000 | 0.886 | 0.675 | 0.842 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Pleasanton Sunol Rd

**Day:** Friday
**Date:** 3/31/2017

**City:** Pleasanton
**Project #:** CA17_7212_001

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 396 | 379 | 775 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 6 | | 7 | | 13 | |
| 00:15 | | | 2 | | 0 | | 2 | | 12:15 | | | 12 | | 2 | | 14 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 6 | | 4 | | 10 | |
| 00:45 | | | 0 | 2 | 0 | | 0 | 2 | 12:45 | | | 3 | 27 | 4 | 17 | 7 | 44 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 6 | | 3 | | 9 | |
| 01:15 | | | 1 | | 0 | | 1 | | 13:15 | | | 6 | | 3 | | 9 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 3 | | 12 | | 15 | |
| 01:45 | | | 1 | 2 | 0 | | 1 | 2 | 13:45 | | | 7 | 22 | 6 | 24 | 13 | 46 |
| 02:00 | | | 0 | | 1 | | 1 | | 14:00 | | | 7 | | 8 | | 15 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 5 | | 6 | | 11 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 9 | | 4 | | 13 | |
| 02:45 | | | 0 | | 0 | 1 | 0 | 1 | 14:45 | | | 7 | 28 | 8 | 26 | 15 | 54 |
| 03:00 | | | 1 | | 0 | | 1 | | 15:00 | | | 11 | | 10 | | 21 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 11 | | 3 | | 14 | |
| 03:30 | | | 1 | | 0 | | 1 | | 15:30 | | | 14 | | 6 | | 20 | |
| 03:45 | | | 0 | 2 | 1 | 1 | 1 | 3 | 15:45 | | | 6 | 42 | 9 | 28 | 15 | 70 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 5 | | 11 | | 16 | |
| 04:15 | | | 0 | | 2 | | 2 | | 16:15 | | | 6 | | 4 | | 10 | |
| 04:30 | | | 1 | | 1 | | 2 | | 16:30 | | | 7 | | 5 | | 12 | |
| 04:45 | | | 1 | 2 | 1 | 4 | 2 | 6 | 16:45 | | | 10 | 28 | 3 | 23 | 13 | 51 |
| 05:00 | | | 0 | | 0 | | 0 | | 17:00 | | | 9 | | 2 | | 11 | |
| 05:15 | | | 1 | | 2 | | 3 | | 17:15 | | | 6 | | 12 | | 18 | |
| 05:30 | | | 2 | | 4 | | 6 | | 17:30 | | | 11 | | 5 | | 16 | |
| 05:45 | | | 0 | 3 | 2 | 8 | 2 | 11 | 17:45 | | | 0 | 26 | 5 | 24 | 5 | 50 |
| 06:00 | | | 3 | | 4 | | 7 | | 18:00 | | | 8 | | 5 | | 13 | |
| 06:15 | | | 5 | | 1 | | 6 | | 18:15 | | | 11 | | 6 | | 17 | |
| 06:30 | | | 2 | | 3 | | 5 | | 18:30 | | | 4 | | 8 | | 12 | |
| 06:45 | | | 3 | 13 | 5 | 13 | 8 | 26 | 18:45 | | | 2 | 25 | 3 | 22 | 5 | 47 |
| 07:00 | | | 9 | | 5 | | 14 | | 19:00 | | | 6 | | 5 | | 11 | |
| 07:15 | | | 4 | | 12 | | 16 | | 19:15 | | | 2 | | 3 | | 5 | |
| 07:30 | | | 10 | | 14 | | 24 | | 19:30 | | | 10 | | 7 | | 17 | |
| 07:45 | | | 3 | 26 | 15 | 46 | 18 | 72 | 19:45 | | | 3 | 21 | 9 | 24 | 12 | 45 |
| 08:00 | | | 6 | | 9 | | 15 | | 20:00 | | | 3 | | 2 | | 5 | |
| 08:15 | | | 6 | | 6 | | 12 | | 20:15 | | | 4 | | 4 | | 8 | |
| 08:30 | | | 3 | | 4 | | 7 | | 20:30 | | | 7 | | 0 | | 7 | |
| 08:45 | | | 4 | 19 | 7 | 26 | 11 | 45 | 20:45 | | | 5 | 19 | 2 | 8 | 7 | 27 |
| 09:00 | | | 3 | | 3 | | 6 | | 21:00 | | | 5 | | 3 | | 8 | |
| 09:15 | | | 6 | | 8 | | 14 | | 21:15 | | | 5 | | 2 | | 7 | |
| 09:30 | | | 5 | | 5 | | 10 | | 21:30 | | | 3 | | 4 | | 7 | |
| 09:45 | | | 5 | 19 | 4 | 20 | 9 | 39 | 21:45 | | | 3 | 16 | 1 | 10 | 4 | 26 |
| 10:00 | | | 4 | | 4 | | 8 | | 22:00 | | | 1 | | 0 | | 1 | |
| 10:15 | | | 4 | | 5 | | 9 | | 22:15 | | | 4 | | 2 | | 6 | |
| 10:30 | | | 3 | | 2 | | 5 | | 22:30 | | | 1 | | 2 | | 3 | |
| 10:45 | | | 4 | 15 | 5 | 16 | 9 | 31 | 22:45 | | | 1 | 7 | 4 | 8 | 5 | 15 |
| 11:00 | | | 4 | | 2 | | 6 | | 23:00 | | | 4 | | 2 | | 6 | |
| 11:15 | | | 6 | | 9 | | 15 | | 23:15 | | | 2 | | 2 | | 4 | |
| 11:30 | | | 4 | | 10 | | 14 | | 23:30 | | | 3 | | 2 | | 5 | |
| 11:45 | | | 8 | 22 | 3 | 24 | 11 | 46 | 23:45 | | | 1 | 10 | 0 | 6 | 1 | 16 |
| TOTALS | | | | 125 | | 159 | | 284 | TOTALS | | | | 271 | | 220 | | 491 |
| SPLIT % | | | | 44.0% | | 56.0% | | 36.6% | SPLIT % | | | | 55.2% | | 44.8% | | 63.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 396 | 379 | 775 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:45 | 07:15 | 07:15 | PM Peak Hour | | | 14:45 | 13:30 | 14:45 |
| AM Pk Volume | | | 32 | 50 | 73 | PM Pk Volume | | | 43 | 32 | 70 |
| Pk Hr Factor | | | 0.667 | 0.833 | 0.760 | Pk Hr Factor | | | 0.768 | 0.667 | 0.833 |
| 7 - 9 Volume | 0 | 0 | 45 | 72 | 117 | 4 - 6 Volume | 0 | 0 | 54 | 47 | 101 |
| 7 - 9 Peak Hour | | | 07:00 | 07:15 | 07:15 | 4 - 6 Peak Hour | | | 16:45 | 17:00 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 26 | 50 | 73 | 4 - 6 Pk Volume | 0 | 0 | 36 | 24 | 58 |
| Pk Hr Factor | 0.000 | 0.000 | 0.650 | 0.833 | 0.760 | Pk Hr Factor | 0.000 | 0.000 | 0.818 | 0.500 | 0.806 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Pleasanton Sunol Rd

**Day:** Saturday
**Date:** 4/1/2017

**City:** Pleasanton
**Project #:** CA17_7212_001

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 302 | 325 | 627 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 1 | | 1 | | 12:00 | | | 3 | | 10 | | 13 | |
| 00:15 | | | 3 | | 1 | | 4 | | 12:15 | | | 6 | | 2 | | 8 | |
| 00:30 | | | 1 | | 2 | | 3 | | 12:30 | | | 2 | | 4 | | 6 | |
| 00:45 | | | 0 | 4 | 0 | 4 | 0 | 8 | 12:45 | | | 5 | 16 | 8 | 24 | 13 | 40 |
| 01:00 | | | 1 | | 1 | | 2 | | 13:00 | | | 6 | | 6 | | 12 | |
| 01:15 | | | 0 | | 1 | | 1 | | 13:15 | | | 6 | | 6 | | 12 | |
| 01:30 | | | 1 | | 1 | | 2 | | 13:30 | | | 8 | | 2 | | 10 | |
| 01:45 | | | 0 | 2 | 0 | 3 | 0 | 5 | 13:45 | | | 6 | 26 | 8 | 22 | 14 | 48 |
| 02:00 | | | 2 | | 0 | | 2 | | 14:00 | | | 13 | | 6 | | 19 | |
| 02:15 | | | 2 | | 2 | | 4 | | 14:15 | | | 5 | | 5 | | 10 | |
| 02:30 | | | 0 | | 1 | | 1 | | 14:30 | | | 6 | | 2 | | 8 | |
| 02:45 | | | 1 | 5 | 0 | 3 | 1 | 8 | 14:45 | | | 9 | 33 | 10 | 23 | 19 | 56 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 10 | | 2 | | 12 | |
| 03:15 | | | 1 | | 0 | | 1 | | 15:15 | | | 4 | | 5 | | 9 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 5 | | 6 | | 11 | |
| 03:45 | | | 0 | 1 | 0 | 1 | 0 | 2 | 15:45 | | | 4 | 23 | 4 | 17 | 8 | 40 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 7 | | 3 | | 10 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 4 | | 6 | | 10 | |
| 04:30 | | | 1 | | 1 | | 2 | | 16:30 | | | 3 | | 4 | | 7 | |
| 04:45 | | | 1 | 2 | 1 | 2 | 2 | 4 | 16:45 | | | 6 | 20 | 7 | 20 | 13 | 40 |
| 05:00 | | | 0 | | 0 | | 0 | | 17:00 | | | 5 | | 9 | | 14 | |
| 05:15 | | | 1 | | 4 | | 5 | | 17:15 | | | 6 | | 8 | | 14 | |
| 05:30 | | | 1 | | 2 | | 3 | | 17:30 | | | 7 | | 6 | | 13 | |
| 05:45 | | | 1 | 3 | 1 | 7 | 2 | 10 | 17:45 | | | 4 | 22 | 6 | 29 | 10 | 51 |
| 06:00 | | | 2 | | 0 | | 2 | | 18:00 | | | 6 | | 7 | | 13 | |
| 06:15 | | | 3 | | 2 | | 5 | | 18:15 | | | 8 | | 6 | | 14 | |
| 06:30 | | | 1 | | 1 | | 2 | | 18:30 | | | 4 | | 4 | | 8 | |
| 06:45 | | | 2 | 8 | 4 | 7 | 6 | 15 | 18:45 | | | 1 | 19 | 5 | 22 | 6 | 41 |
| 07:00 | | | 2 | | 1 | | 3 | | 19:00 | | | 4 | | 3 | | 7 | |
| 07:15 | | | 3 | | 4 | | 7 | | 19:15 | | | 0 | | 3 | | 3 | |
| 07:30 | | | 5 | | 3 | | 8 | | 19:30 | | | 0 | | 2 | | 2 | |
| 07:45 | | | 3 | 13 | 4 | 12 | 7 | 25 | 19:45 | | | 1 | 5 | 6 | 14 | 7 | 19 |
| 08:00 | | | 3 | | 3 | | 6 | | 20:00 | | | 2 | | 6 | | 8 | |
| 08:15 | | | 1 | | 5 | | 6 | | 20:15 | | | 5 | | 4 | | 9 | |
| 08:30 | | | 4 | | 4 | | 8 | | 20:30 | | | 5 | | 2 | | 7 | |
| 08:45 | | | 2 | 10 | 5 | 17 | 7 | 27 | 20:45 | | | 3 | 15 | 2 | 14 | 5 | 29 |
| 09:00 | | | 5 | | 4 | | 9 | | 21:00 | | | 2 | | 3 | | 5 | |
| 09:15 | | | 1 | | 2 | | 3 | | 21:15 | | | 3 | | 4 | | 7 | |
| 09:30 | | | 1 | | 7 | | 8 | | 21:30 | | | 3 | | 1 | | 4 | |
| 09:45 | | | 4 | 11 | 9 | 22 | 13 | 33 | 21:45 | | | 0 | 8 | 1 | 9 | 1 | 17 |
| 10:00 | | | 6 | | 6 | | 12 | | 22:00 | | | 2 | | 2 | | 4 | |
| 10:15 | | | 6 | | 5 | | 11 | | 22:15 | | | 1 | | 1 | | 2 | |
| 10:30 | | | 5 | | 7 | | 12 | | 22:30 | | | 1 | | 0 | | 1 | |
| 10:45 | | | 7 | 24 | 5 | 23 | 12 | 47 | 22:45 | | | 2 | 6 | 0 | 3 | 2 | 9 |
| 11:00 | | | 6 | | 4 | | 10 | | 23:00 | | | 1 | | 1 | | 2 | |
| 11:15 | | | 7 | | 6 | | 13 | | 23:15 | | | 1 | | 3 | | 4 | |
| 11:30 | | | 6 | | 2 | | 8 | | 23:30 | | | 0 | | 2 | | 2 | |
| 11:45 | | | 3 | 22 | 6 | 18 | 9 | 40 | 23:45 | | | 2 | 4 | 3 | 9 | 5 | 13 |
| TOTALS | | | | 105 | | 119 | | 224 | TOTALS | | | | 197 | | 206 | | 403 |
| SPLIT % | | | | 46.9% | | 53.1% | | 35.7% | SPLIT % | | | | 48.9% | | 51.1% | | 64.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 302 | 325 | 627 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 10:45 | 09:30 | 09:45 | PM Peak Hour | | | 13:15 | 16:45 | 14:00 |
| AM Pk Volume | | | 26 | 27 | 48 | PM Pk Volume | | | 33 | 30 | 56 |
| Pk Hr Factor | | | 0.929 | 0.750 | 0.923 | Pk Hr Factor | | | 0.635 | 0.833 | 0.737 |
| 7 - 9 Volume | 0 | 0 | 23 | 29 | 52 | 4 - 6 Volume | 0 | 0 | 42 | 49 | 91 |
| 7 - 9 Peak Hour | | | 07:15 | 08:00 | 07:15 | 4 - 6 Peak Hour | | | 16:45 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 14 | 17 | 28 | 4 - 6 Pk Volume | 0 | 0 | 24 | 30 | 54 |
| Pk Hr Factor | 0.000 | 0.000 | 0.700 | 0.850 | 0.875 | Pk Hr Factor | 0.000 | 0.000 | 0.857 | 0.833 | 0.964 |

Prepared by NDS/ATD

# VOLUME

Riddell St S/O Sunol Blvd

**Day:** Thursday
**Date:** 3/30/2017

**City:** Pleasanton
**Project #:** CA17_7212_002

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 185 | 262 | 0 | 0 | 447 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 0 | | | | | | 0 | | 12:00 | 2 | | 4 | | | | | | 6 | |
| 00:15 | 0 | | 1 | | | | | | 1 | | 12:15 | 1 | | 3 | | | | | | 4 | |
| 00:30 | 1 | | 0 | | | | | | 1 | | 12:30 | 2 | | 6 | | | | | | 8 | |
| 00:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 12:45 | 4 | 9 | 10 | 23 | | | | | 14 | 32 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 4 | | 6 | | | | | | 10 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 3 | | 4 | | | | | | 7 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 3 | | 4 | | | | | | 7 | |
| 01:45 | 0 | | 0 | | | | | | 0 | | 13:45 | 1 | 11 | 4 | 18 | | | | | 5 | 29 |
| 02:00 | 1 | | 1 | | | | | | 2 | | 14:00 | 4 | | 5 | | | | | | 9 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 3 | | 8 | | | | | | 11 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 7 | | 2 | | | | | | 9 | |
| 02:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 14:45 | 5 | 19 | 4 | 19 | | | | | 9 | 38 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 2 | | 8 | | | | | | 10 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 3 | | 3 | | | | | | 6 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 4 | | 4 | | | | | | 8 | |
| 03:45 | 0 | | 0 | | | | | | 0 | | 15:45 | 2 | 11 | 2 | 17 | | | | | 4 | 28 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 1 | | 4 | | | | | | 5 | |
| 04:15 | 0 | | 0 | | | | | | 0 | | 16:15 | 6 | | 7 | | | | | | 13 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 2 | | 5 | | | | | | 7 | |
| 04:45 | 0 | | 0 | | | | | | 0 | | 16:45 | 3 | 12 | 4 | 20 | | | | | 7 | 32 |
| 05:00 | 0 | | 0 | | | | | | 0 | | 17:00 | 3 | | 6 | | | | | | 9 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 2 | | 1 | | | | | | 3 | |
| 05:30 | 1 | | 1 | | | | | | 2 | | 17:30 | 4 | | 4 | | | | | | 8 | |
| 05:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 17:45 | 4 | 13 | 6 | 17 | | | | | 10 | 30 |
| 06:00 | 2 | | 2 | | | | | | 4 | | 18:00 | 5 | | 13 | | | | | | 18 | |
| 06:15 | 2 | | 0 | | | | | | 2 | | 18:15 | 1 | | 7 | | | | | | 8 | |
| 06:30 | 2 | | 1 | | | | | | 3 | | 18:30 | 3 | | 3 | | | | | | 6 | |
| 06:45 | 1 | 7 | 1 | 4 | | | | | 2 | 11 | 18:45 | 3 | 12 | 4 | 27 | | | | | 7 | 39 |
| 07:00 | 3 | | 0 | | | | | | 3 | | 19:00 | 4 | | 3 | | | | | | 7 | |
| 07:15 | 3 | | 2 | | | | | | 5 | | 19:15 | 1 | | 9 | | | | | | 10 | |
| 07:30 | 3 | | 0 | | | | | | 3 | | 19:30 | 7 | | 4 | | | | | | 11 | |
| 07:45 | 13 | 22 | 0 | 2 | | | | | 13 | 24 | 19:45 | 1 | 13 | 4 | 20 | | | | | 5 | 33 |
| 08:00 | 3 | | 3 | | | | | | 6 | | 20:00 | 3 | | 4 | | | | | | 7 | |
| 08:15 | 1 | | 3 | | | | | | 4 | | 20:15 | 0 | | 4 | | | | | | 4 | |
| 08:30 | 4 | | 3 | | | | | | 7 | | 20:30 | 0 | | 8 | | | | | | 8 | |
| 08:45 | 1 | 9 | 4 | 13 | | | | | 5 | 22 | 20:45 | 2 | 5 | 1 | 17 | | | | | 3 | 22 |
| 09:00 | 3 | | 2 | | | | | | 5 | | 21:00 | 0 | | 1 | | | | | | 1 | |
| 09:15 | 4 | | 5 | | | | | | 9 | | 21:15 | 1 | | 1 | | | | | | 2 | |
| 09:30 | 2 | | 9 | | | | | | 11 | | 21:30 | 0 | | 2 | | | | | | 2 | |
| 09:45 | 4 | 13 | 4 | 20 | | | | | 8 | 33 | 21:45 | 0 | 1 | 4 | 8 | | | | | 4 | 9 |
| 10:00 | 3 | | 2 | | | | | | 5 | | 22:00 | 0 | | 1 | | | | | | 1 | |
| 10:15 | 4 | | 4 | | | | | | 8 | | 22:15 | 1 | | 1 | | | | | | 2 | |
| 10:30 | 2 | | 5 | | | | | | 7 | | 22:30 | 0 | | 0 | | | | | | 0 | |
| 10:45 | 3 | 12 | 6 | 17 | | | | | 9 | 29 | 22:45 | 2 | 3 | 2 | 4 | | | | | 4 | 7 |
| 11:00 | 1 | | 1 | | | | | | 2 | | 23:00 | 0 | | 0 | | | | | | 0 | |
| 11:15 | 2 | | 3 | | | | | | 5 | | 23:15 | 0 | | 0 | | | | | | 0 | |
| 11:30 | 5 | | 3 | | | | | | 8 | | 23:30 | 0 | | 0 | | | | | | 0 | |
| 11:45 | 2 | 10 | 6 | 13 | | | | | 8 | 23 | 23:45 | 0 | | 0 | | | | | | 0 | |
| TOTALS | | 76 | | 72 | | | | | | 148 | TOTALS | | 109 | | 190 | | | | | | 299 |
| SPLIT % | | 51.4% | | 48.6% | | | | | | 33.1% | SPLIT % | | 36.5% | | 63.5% | | | | | | 66.9% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 185 | 262 | 0 | 0 | 447 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 07:00 | 08:45 | | | 09:00 | PM Peak Hour | 14:00 | 17:30 | | | 17:30 |
| AM Pk Volume | 22 | 20 | | | 33 | PM Pk Volume | 19 | 30 | | | 44 |
| Pk Hr Factor | 0.423 | 0.556 | | | 0.750 | Pk Hr Factor | 0.679 | 0.577 | | | 0.611 |
| 7 - 9 Volume | 31 | 15 | 0 | 0 | 46 | 4 - 6 Volume | 25 | 37 | 0 | 0 | 62 |
| 7 - 9 Peak Hour | 07:00 | 08:00 | | | 07:45 | 4 - 6 Peak Hour | 16:15 | 16:15 | | | 16:15 |
| 7 - 9 Pk Volume | 22 | 13 | 0 | 0 | 30 | 4 - 6 Pk Volume | 14 | 22 | 0 | 0 | 36 |
| Pk Hr Factor | 0.423 | 0.813 | 0.000 | 0.000 | 0.577 | Pk Hr Factor | 0.583 | 0.786 | 0.000 | 0.000 | 0.692 |

Prepared by NDS/ATD

# VOLUME

Riddell St S/O Sunol Blvd

**Day:** Friday
**Date:** 3/31/2017

**City:** Pleasanton
**Project #:** CA17_7212_002

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 203 | 273 | 0 | 0 | 476 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 0 | | | | | | 0 | | 12:00 | 3 | | 11 | | | | | | 14 | |
| 00:15 | 0 | | 0 | | | | | | 0 | | 12:15 | 2 | | 7 | | | | | | 9 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 6 | | 2 | | | | | | 8 | |
| 00:45 | 0 | | 0 | | | | | | 0 | | 12:45 | 5 | 16 | 6 | 26 | | | | | 11 | 42 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 2 | | 3 | | | | | | 5 | |
| 01:15 | 1 | | 1 | | | | | | 2 | | 13:15 | 4 | | 8 | | | | | | 12 | |
| 01:30 | 1 | | 0 | | | | | | 1 | | 13:30 | 4 | | 5 | | | | | | 9 | |
| 01:45 | 0 | 2 | 0 | 1 | | | | | 0 | 3 | 13:45 | 2 | 12 | 5 | 21 | | | | | 7 | 33 |
| 02:00 | 0 | | 0 | | | | | | 0 | | 14:00 | 3 | | 5 | | | | | | 8 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 2 | | 2 | | | | | | 4 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 3 | | 3 | | | | | | 6 | |
| 02:45 | 0 | | 0 | | | | | | 0 | | 14:45 | 6 | 14 | 8 | 18 | | | | | 14 | 32 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 7 | | 7 | | | | | | 14 | |
| 03:15 | 0 | | 1 | | | | | | 1 | | 15:15 | 4 | | 9 | | | | | | 13 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 7 | | 6 | | | | | | 13 | |
| 03:45 | 0 | | 0 | 1 | | | | | 0 | 1 | 15:45 | 3 | 21 | 5 | 27 | | | | | 8 | 48 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 4 | | 7 | | | | | | 11 | |
| 04:15 | 0 | | 0 | | | | | | 0 | | 16:15 | 8 | | 3 | | | | | | 11 | |
| 04:30 | 0 | | 1 | | | | | | 1 | | 16:30 | 4 | | 5 | | | | | | 9 | |
| 04:45 | 0 | | 1 | 2 | | | | | 1 | 2 | 16:45 | 3 | 19 | 9 | 24 | | | | | 12 | 43 |
| 05:00 | 1 | | 0 | | | | | | 1 | | 17:00 | 5 | | 6 | | | | | | 11 | |
| 05:15 | 1 | | 0 | | | | | | 1 | | 17:15 | 3 | | 4 | | | | | | 7 | |
| 05:30 | 0 | | 1 | | | | | | 1 | | 17:30 | 6 | | 8 | | | | | | 14 | |
| 05:45 | 0 | 2 | 0 | 1 | | | | | 0 | 3 | 17:45 | 3 | 17 | 5 | 23 | | | | | 8 | 40 |
| 06:00 | 0 | | 1 | | | | | | 1 | | 18:00 | 2 | | 2 | | | | | | 4 | |
| 06:15 | 1 | | 1 | | | | | | 2 | | 18:15 | 1 | | 3 | | | | | | 4 | |
| 06:30 | 4 | | 1 | | | | | | 5 | | 18:30 | 3 | | 4 | | | | | | 7 | |
| 06:45 | 1 | 6 | 0 | 3 | | | | | 1 | 9 | 18:45 | 5 | 11 | 3 | 12 | | | | | 8 | 23 |
| 07:00 | 0 | | 1 | | | | | | 1 | | 19:00 | 1 | | 3 | | | | | | 4 | |
| 07:15 | 3 | | 1 | | | | | | 4 | | 19:15 | 0 | | 2 | | | | | | 2 | |
| 07:30 | 3 | | 4 | | | | | | 7 | | 19:30 | 3 | | 5 | | | | | | 8 | |
| 07:45 | 6 | 12 | 0 | 6 | | | | | 6 | 18 | 19:45 | 2 | 6 | 3 | 13 | | | | | 5 | 19 |
| 08:00 | 7 | | 2 | | | | | | 9 | | 20:00 | 6 | | 6 | | | | | | 12 | |
| 08:15 | 4 | | 2 | | | | | | 6 | | 20:15 | 1 | | 4 | | | | | | 5 | |
| 08:30 | 1 | | 3 | | | | | | 4 | | 20:30 | 1 | | 4 | | | | | | 5 | |
| 08:45 | 2 | 14 | 2 | 9 | | | | | 4 | 23 | 20:45 | 1 | 9 | 5 | 19 | | | | | 6 | 28 |
| 09:00 | 4 | | 5 | | | | | | 9 | | 21:00 | 1 | | 1 | | | | | | 2 | |
| 09:15 | 2 | | 1 | | | | | | 3 | | 21:15 | 2 | | 7 | | | | | | 9 | |
| 09:30 | 2 | | 2 | | | | | | 4 | | 21:30 | 0 | | 2 | | | | | | 2 | |
| 09:45 | 1 | 9 | 1 | 9 | | | | | 2 | 18 | 21:45 | 1 | 4 | 2 | 12 | | | | | 3 | 16 |
| 10:00 | 4 | | 3 | | | | | | 7 | | 22:00 | 1 | | 2 | | | | | | 3 | |
| 10:15 | 5 | | 3 | | | | | | 8 | | 22:15 | 1 | | 0 | | | | | | 1 | |
| 10:30 | 1 | | 6 | | | | | | 7 | | 22:30 | 0 | | 0 | | | | | | 0 | |
| 10:45 | 3 | 13 | 3 | 15 | | | | | 6 | 28 | 22:45 | 1 | 3 | 2 | 4 | | | | | 3 | 7 |
| 11:00 | 3 | | 2 | | | | | | 5 | | 23:00 | 0 | | 2 | | | | | | 2 | |
| 11:15 | 2 | | 7 | | | | | | 9 | | 23:15 | 4 | | 5 | | | | | | 9 | |
| 11:30 | 0 | | 5 | | | | | | 5 | | 23:30 | 0 | | 3 | | | | | | 3 | |
| 11:45 | 4 | 9 | 3 | 17 | | | | | 7 | 26 | 23:45 | 0 | 4 | 0 | 10 | | | | | 0 | 14 |
| TOTALS | | 67 | | 64 | | | | | | 131 | TOTALS | | 136 | | 209 | | | | | | 345 |
| SPLIT % | | 51.1% | | 48.9% | | | | | | 27.5% | SPLIT % | | 39.4% | | 60.6% | | | | | | 72.5% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 203 | 273 | 0 | 0 | 476 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 07:30 | 11:15 | | | 11:45 | PM Peak Hour | 14:45 | 14:45 | | | 14:45 |
| AM Pk Volume | 20 | 26 | | | 38 | PM Pk Volume | 24 | 30 | | | 54 |
| Pk Hr Factor | 0.714 | 0.591 | | | 0.679 | Pk Hr Factor | 0.857 | 0.833 | | | 0.964 |
| 7 - 9 Volume | 26 | 15 | 0 | 0 | 41 | 4 - 6 Volume | 36 | 47 | 0 | 0 | 83 |
| 7 - 9 Peak Hour | 07:30 | 08:00 | | | 07:30 | 4 - 6 Peak Hour | 16:15 | 16:45 | | | 16:45 |
| 7 - 9 Pk Volume | 20 | 9 | 0 | 0 | 28 | 4 - 6 Pk Volume | 20 | 27 | 0 | 0 | 44 |
| Pk Hr Factor | 0.714 | 0.750 | 0.000 | 0.000 | 0.778 | Pk Hr Factor | 0.625 | 0.750 | 0.000 | 0.000 | 0.786 |

Prepared by NDS/ATD

# VOLUME

Riddell St S/O Sunol Blvd

**Day:** Saturday
**Date:** 4/1/2017

**City:** Pleasanton
**Project #:** CA17_7212_002

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 163 | 321 | 0 | 0 | 484 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 0 | | | | | | 0 | | 12:00 | 3 | | 7 | | | | | | 10 | |
| 00:15 | 1 | | 2 | | | | | | 3 | | 12:15 | 2 | | 7 | | | | | | 9 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 7 | | 4 | | | | | | 11 | |
| 00:45 | 0 | 1 | 1 | 3 | | | | | 1 | 4 | 12:45 | 5 | 17 | 4 | 22 | | | | | 9 | 39 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 1 | | 2 | | | | | | 3 | |
| 01:15 | 0 | | 2 | | | | | | 2 | | 13:15 | 3 | | 5 | | | | | | 8 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 4 | | 9 | | | | | | 13 | |
| 01:45 | 1 | 1 | 1 | 3 | | | | | 2 | 4 | 13:45 | 2 | 10 | 7 | 23 | | | | | 9 | 33 |
| 02:00 | 1 | | 0 | | | | | | 1 | | 14:00 | 0 | | 8 | | | | | | 8 | |
| 02:15 | 0 | | 1 | | | | | | 1 | | 14:15 | 6 | | 9 | | | | | | 15 | |
| 02:30 | 1 | | 0 | | | | | | 1 | | 14:30 | 2 | | 6 | | | | | | 8 | |
| 02:45 | 0 | 2 | 0 | 1 | | | | | 0 | 3 | 14:45 | 1 | 9 | 6 | 29 | | | | | 7 | 38 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 5 | | 7 | | | | | | 12 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 0 | | 9 | | | | | | 9 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 4 | | 4 | | | | | | 8 | |
| 03:45 | 0 | | 0 | | | | | | 0 | | 15:45 | 3 | 12 | 4 | 24 | | | | | 7 | 36 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 3 | | 8 | | | | | | 11 | |
| 04:15 | 0 | | 0 | | | | | | 0 | | 16:15 | 5 | | 5 | | | | | | 10 | |
| 04:30 | 0 | | 1 | | | | | | 1 | | 16:30 | 5 | | 5 | | | | | | 10 | |
| 04:45 | 0 | | 0 | 1 | | | | | 0 | 1 | 16:45 | 4 | 17 | 4 | 22 | | | | | 8 | 39 |
| 05:00 | 0 | | 0 | | | | | | 0 | | 17:00 | 1 | | 2 | | | | | | 3 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 3 | | 6 | | | | | | 9 | |
| 05:30 | 0 | | 0 | | | | | | 0 | | 17:30 | 3 | | 0 | | | | | | 3 | |
| 05:45 | 0 | | 1 | 1 | | | | | 1 | 1 | 17:45 | 4 | 11 | 4 | 12 | | | | | 8 | 23 |
| 06:00 | 1 | | 2 | | | | | | 3 | | 18:00 | 3 | | 3 | | | | | | 6 | |
| 06:15 | 0 | | 3 | | | | | | 3 | | 18:15 | 4 | | 3 | | | | | | 7 | |
| 06:30 | 1 | | 2 | | | | | | 3 | | 18:30 | 2 | | 2 | | | | | | 4 | |
| 06:45 | 0 | 2 | 1 | 8 | | | | | 1 | 10 | 18:45 | 1 | 10 | 7 | 15 | | | | | 8 | 25 |
| 07:00 | 0 | | 2 | | | | | | 2 | | 19:00 | 0 | | 3 | | | | | | 3 | |
| 07:15 | 1 | | 6 | | | | | | 7 | | 19:15 | 1 | | 4 | | | | | | 5 | |
| 07:30 | 0 | | 0 | | | | | | 0 | | 19:30 | 2 | | 5 | | | | | | 7 | |
| 07:45 | 2 | 3 | 2 | 10 | | | | | 4 | 13 | 19:45 | 0 | 3 | 3 | 15 | | | | | 3 | 18 |
| 08:00 | 1 | | 2 | | | | | | 3 | | 20:00 | 2 | | 1 | | | | | | 3 | |
| 08:15 | 2 | | 4 | | | | | | 6 | | 20:15 | 1 | | 6 | | | | | | 7 | |
| 08:30 | 2 | | 10 | | | | | | 12 | | 20:30 | 1 | | 0 | | | | | | 1 | |
| 08:45 | 0 | 5 | 7 | 23 | | | | | 7 | 28 | 20:45 | 2 | 6 | 1 | 8 | | | | | 3 | 14 |
| 09:00 | 4 | | 5 | | | | | | 9 | | 21:00 | 3 | | 3 | | | | | | 6 | |
| 09:15 | 2 | | 5 | | | | | | 7 | | 21:15 | 3 | | 3 | | | | | | 6 | |
| 09:30 | 4 | | 6 | | | | | | 10 | | 21:30 | 0 | | 4 | | | | | | 4 | |
| 09:45 | 3 | 13 | 3 | 19 | | | | | 6 | 32 | 21:45 | 1 | 7 | 1 | 11 | | | | | 2 | 18 |
| 10:00 | 4 | | 9 | | | | | | 13 | | 22:00 | 1 | | 1 | | | | | | 2 | |
| 10:15 | 6 | | 6 | | | | | | 12 | | 22:15 | 0 | | 3 | | | | | | 3 | |
| 10:30 | 3 | | 10 | | | | | | 13 | | 22:30 | 0 | | 1 | | | | | | 1 | |
| 10:45 | 4 | 17 | 8 | 33 | | | | | 12 | 50 | 22:45 | 0 | 1 | 1 | 6 | | | | | 1 | 7 |
| 11:00 | 4 | | 12 | | | | | | 16 | | 23:00 | 1 | | 2 | | | | | | 3 | |
| 11:15 | 4 | | 5 | | | | | | 9 | | 23:15 | 1 | | 4 | | | | | | 5 | |
| 11:30 | 1 | | 2 | | | | | | 3 | | 23:30 | 1 | | 1 | | | | | | 2 | |
| 11:45 | 4 | 13 | 4 | 23 | | | | | 8 | 36 | 23:45 | 0 | 3 | 2 | 9 | | | | | 2 | 12 |
| TOTALS | | 57 | | 125 | | | | | | 182 | TOTALS | | 106 | | 196 | | | | | | 302 |
| SPLIT % | | 31.3% | | 68.7% | | | | | | 37.6% | SPLIT % | | 35.1% | | 64.9% | | | | | | 62.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 163 | 321 | 0 | 0 | 484 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 09:30 | 10:15 | | | 10:15 | PM Peak Hour | 12:00 | 13:30 | | | 13:30 |
| AM Pk Volume | 17 | 36 | | | 53 | PM Pk Volume | 17 | 33 | | | 45 |
| Pk Hr Factor | 0.708 | 0.750 | | | 0.828 | Pk Hr Factor | 0.607 | 0.917 | | | 0.750 |
| 7 - 9 Volume | 8 | 33 | 0 | 0 | 41 | 4 - 6 Volume | 28 | 34 | 0 | 0 | 62 |
| 7 - 9 Peak Hour | 07:45 | 08:00 | | | 08:00 | 4 - 6 Peak Hour | 16:00 | 16:00 | | | 16:00 |
| 7 - 9 Pk Volume | 7 | 23 | 0 | 0 | 28 | 4 - 6 Pk Volume | 17 | 22 | 0 | 0 | 39 |
| Pk Hr Factor | 0.875 | 0.575 | 0.000 | 0.000 | 0.583 | Pk Hr Factor | 0.850 | 0.688 | 0.000 | 0.000 | 0.886 |

Prepared by NDS/ATD

# VOLUME

Arlington Dr E/O Sunol Blvd

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 607 | 634 | 1,241 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 9 | | 14 | | 23 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 12 | | 10 | | 22 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 10 | | 12 | | 22 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 7 | 38 | 11 | 47 | 18 | 85 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 12 | | 13 | | 25 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 7 | | 9 | | 16 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 7 | | 14 | | 21 | |
| 01:45 | | | 0 | | 0 | | 0 | | 13:45 | | | 7 | 33 | 8 | 44 | 15 | 77 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 10 | | 11 | | 21 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 8 | | 14 | | 22 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 9 | | 10 | | 19 | |
| 02:45 | | | 1 | 1 | 1 | 1 | 2 | 2 | 14:45 | | | 11 | 38 | 14 | 49 | 25 | 87 |
| 03:00 | | | 0 | | 1 | | 1 | | 15:00 | | | 21 | | 13 | | 34 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 9 | | 10 | | 19 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 18 | | 10 | | 28 | |
| 03:45 | | | 0 | | 0 | 2 | 0 | 2 | 15:45 | | | 9 | 57 | 9 | 42 | 18 | 99 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 12 | | 6 | | 18 | |
| 04:15 | | | 0 | | 1 | | 1 | | 16:15 | | | 9 | | 10 | | 19 | |
| 04:30 | | | 2 | | 1 | | 3 | | 16:30 | | | 18 | | 7 | | 25 | |
| 04:45 | | | 0 | 2 | 2 | 4 | 2 | 6 | 16:45 | | | 6 | 45 | 13 | 36 | 19 | 81 |
| 05:00 | | | 0 | | 0 | | 0 | | 17:00 | | | 15 | | 15 | | 30 | |
| 05:15 | | | 0 | | 5 | | 5 | | 17:15 | | | 19 | | 10 | | 29 | |
| 05:30 | | | 1 | | 2 | | 3 | | 17:30 | | | 13 | | 16 | | 29 | |
| 05:45 | | | 1 | 2 | 5 | 12 | 6 | 14 | 17:45 | | | 11 | 58 | 10 | 51 | 21 | 109 |
| 06:00 | | | 2 | | 4 | | 6 | | 18:00 | | | 13 | | 12 | | 25 | |
| 06:15 | | | 0 | | 7 | | 7 | | 18:15 | | | 15 | | 13 | | 28 | |
| 06:30 | | | 3 | | 4 | | 7 | | 18:30 | | | 15 | | 7 | | 22 | |
| 06:45 | | | 1 | 6 | 5 | 20 | 6 | 26 | 18:45 | | | 13 | 56 | 7 | 39 | 20 | 95 |
| 07:00 | | | 4 | | 11 | | 15 | | 19:00 | | | 9 | | 7 | | 16 | |
| 07:15 | | | 12 | | 16 | | 28 | | 19:15 | | | 10 | | 6 | | 16 | |
| 07:30 | | | 7 | | 13 | | 20 | | 19:30 | | | 7 | | 4 | | 11 | |
| 07:45 | | | 1 | 24 | 20 | 60 | 21 | 84 | 19:45 | | | 11 | 37 | 5 | 22 | 16 | 59 |
| 08:00 | | | 13 | | 16 | | 29 | | 20:00 | | | 10 | | 4 | | 14 | |
| 08:15 | | | 13 | | 15 | | 28 | | 20:15 | | | 9 | | 8 | | 17 | |
| 08:30 | | | 8 | | 6 | | 14 | | 20:30 | | | 11 | | 6 | | 17 | |
| 08:45 | | | 3 | 37 | 11 | 48 | 14 | 85 | 20:45 | | | 10 | 40 | 1 | 19 | 11 | 59 |
| 09:00 | | | 4 | | 11 | | 15 | | 21:00 | | | 6 | | 3 | | 9 | |
| 09:15 | | | 5 | | 5 | | 10 | | 21:15 | | | 6 | | 2 | | 8 | |
| 09:30 | | | 6 | | 12 | | 18 | | 21:30 | | | 2 | | 1 | | 3 | |
| 09:45 | | | 10 | 25 | 5 | 33 | 15 | 58 | 21:45 | | | 2 | 16 | 1 | 7 | 3 | 23 |
| 10:00 | | | 6 | | 8 | | 14 | | 22:00 | | | 10 | | 2 | | 12 | |
| 10:15 | | | 6 | | 14 | | 20 | | 22:15 | | | 3 | | 1 | | 4 | |
| 10:30 | | | 6 | | 12 | | 18 | | 22:30 | | | 2 | | 2 | | 4 | |
| 10:45 | | | 4 | 22 | 7 | 41 | 11 | 63 | 22:45 | | | 4 | 19 | 2 | 7 | 6 | 26 |
| 11:00 | | | 11 | | 6 | | 17 | | 23:00 | | | 1 | | 2 | | 3 | |
| 11:15 | | | 9 | | 15 | | 24 | | 23:15 | | | 3 | | 2 | | 5 | |
| 11:30 | | | 15 | | 13 | | 28 | | 23:30 | | | 2 | | 1 | | 3 | |
| 11:45 | | | 9 | 44 | 10 | 44 | 19 | 88 | 23:45 | | | 1 | 7 | 1 | 6 | 2 | 13 |
| TOTALS | | | | 163 | | 265 | | 428 | TOTALS | | | | 444 | | 369 | | 813 |
| SPLIT % | | | | 38.1% | | 61.9% | | 34.5% | SPLIT % | | | | 54.6% | | 45.4% | | 65.5% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 607 | 634 | 1,241 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:30 | 07:15 | 07:15 | PM Peak Hour | | | 14:45 | 16:45 | 17:00 |
| AM Pk Volume | | | 45 | 65 | 98 | PM Pk Volume | | | 59 | 54 | 109 |
| Pk Hr Factor | | | 0.750 | 0.813 | 0.845 | Pk Hr Factor | | | 0.702 | 0.844 | 0.908 |
| 7 - 9 Volume | 0 | 0 | 61 | 108 | 169 | 4 - 6 Volume | 0 | 0 | 103 | 87 | 190 |
| 7 - 9 Peak Hour | | | 08:00 | 07:15 | 07:15 | 4 - 6 Peak Hour | | | 16:30 | 16:45 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 37 | 65 | 98 | 4 - 6 Pk Volume | 0 | 0 | 58 | 54 | 109 |
| Pk Hr Factor | 0.000 | 0.000 | 0.712 | 0.813 | 0.845 | Pk Hr Factor | 0.000 | 0.000 | 0.763 | 0.844 | 0.908 |

Prepared by NDS/ATD

# VOLUME

Arlington Dr E/O Sunol Blvd

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 663 | 672 | 1,335 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 7 | | 6 | | 13 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 8 | | 12 | | 20 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 15 | | 7 | | 22 | |
| 00:45 | | | 1 | 1 | 0 | | 1 | 1 | 12:45 | | | 9 | 39 | 12 | 37 | 21 | 76 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 9 | | 13 | | 22 | |
| 01:15 | | | 2 | | 1 | | 3 | | 13:15 | | | 17 | | 14 | | 31 | |
| 01:30 | | | 1 | | 1 | | 2 | | 13:30 | | | 10 | | 9 | | 19 | |
| 01:45 | | | 0 | 3 | 0 | 2 | 0 | 5 | 13:45 | | | 10 | 46 | 7 | 43 | 17 | 89 |
| 02:00 | | | 0 | | 1 | | 1 | | 14:00 | | | 13 | | 11 | | 24 | |
| 02:15 | | | 1 | | 1 | | 2 | | 14:15 | | | 8 | | 10 | | 18 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 9 | | 17 | | 26 | |
| 02:45 | | | 0 | 2 | 1 | 3 | 1 | 5 | 14:45 | | | 9 | 39 | 15 | 53 | 24 | 92 |
| 03:00 | | | 1 | | 1 | | 2 | | 15:00 | | | 12 | | 13 | | 25 | |
| 03:15 | | | 0 | | 1 | | 1 | | 15:15 | | | 15 | | 8 | | 23 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 14 | | 12 | | 26 | |
| 03:45 | | | 0 | 1 | 0 | 3 | 0 | 4 | 15:45 | | | 13 | 54 | 10 | 43 | 23 | 97 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 10 | | 4 | | 14 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 8 | | 12 | | 20 | |
| 04:30 | | | 0 | | 2 | | 2 | | 16:30 | | | 15 | | 7 | | 22 | |
| 04:45 | | | 1 | 1 | 1 | 3 | 2 | 4 | 16:45 | | | 12 | 45 | 9 | 32 | 21 | 77 |
| 05:00 | | | 0 | | 1 | | 1 | | 17:00 | | | 12 | | 13 | | 25 | |
| 05:15 | | | 0 | | 1 | | 1 | | 17:15 | | | 17 | | 12 | | 29 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 13 | | 10 | | 23 | |
| 05:45 | | | 0 | | 2 | 4 | 2 | 4 | 17:45 | | | 14 | 56 | 16 | 51 | 30 | 107 |
| 06:00 | | | 0 | | 1 | | 1 | | 18:00 | | | 11 | | 9 | | 20 | |
| 06:15 | | | 0 | | 7 | | 7 | | 18:15 | | | 9 | | 11 | | 20 | |
| 06:30 | | | 2 | | 6 | | 8 | | 18:30 | | | 12 | | 5 | | 17 | |
| 06:45 | | | 2 | 4 | 8 | 22 | 10 | 26 | 18:45 | | | 13 | 45 | 11 | 36 | 24 | 81 |
| 07:00 | | | 6 | | 7 | | 13 | | 19:00 | | | 15 | | 4 | | 19 | |
| 07:15 | | | 2 | | 14 | | 16 | | 19:15 | | | 11 | | 11 | | 22 | |
| 07:30 | | | 6 | | 16 | | 22 | | 19:30 | | | 17 | | 2 | | 19 | |
| 07:45 | | | 8 | 22 | 21 | 58 | 29 | 80 | 19:45 | | | 7 | 50 | 7 | 24 | 14 | 74 |
| 08:00 | | | 15 | | 14 | | 29 | | 20:00 | | | 4 | | 1 | | 5 | |
| 08:15 | | | 9 | | 15 | | 24 | | 20:15 | | | 8 | | 4 | | 12 | |
| 08:30 | | | 8 | | 9 | | 17 | | 20:30 | | | 7 | | 7 | | 14 | |
| 08:45 | | | 7 | 39 | 14 | 52 | 21 | 91 | 20:45 | | | 7 | 26 | 8 | 20 | 15 | 46 |
| 09:00 | | | 13 | | 8 | | 21 | | 21:00 | | | 10 | | 12 | | 22 | |
| 09:15 | | | 3 | | 7 | | 10 | | 21:15 | | | 10 | | 4 | | 14 | |
| 09:30 | | | 11 | | 15 | | 26 | | 21:30 | | | 8 | | 3 | | 11 | |
| 09:45 | | | 8 | 35 | 9 | 39 | 17 | 74 | 21:45 | | | 5 | 33 | 6 | 25 | 11 | 58 |
| 10:00 | | | 7 | | 10 | | 17 | | 22:00 | | | 6 | | 1 | | 7 | |
| 10:15 | | | 9 | | 16 | | 25 | | 22:15 | | | 9 | | 7 | | 16 | |
| 10:30 | | | 7 | | 12 | | 19 | | 22:30 | | | 4 | | 1 | | 5 | |
| 10:45 | | | 8 | 31 | 15 | 53 | 23 | 84 | 22:45 | | | 5 | 24 | 2 | 11 | 7 | 35 |
| 11:00 | | | 12 | | 12 | | 24 | | 23:00 | | | 3 | | 1 | | 4 | |
| 11:15 | | | 19 | | 10 | | 29 | | 23:15 | | | 1 | | 2 | | 3 | |
| 11:30 | | | 12 | | 17 | | 29 | | 23:30 | | | 4 | | 1 | | 5 | |
| 11:45 | | | 11 | 54 | 13 | 52 | 24 | 106 | 23:45 | | | 5 | 13 | 2 | 6 | 7 | 19 |
| TOTALS | | | | 193 | | 291 | | 484 | TOTALS | | | | 470 | | 381 | | 851 |
| SPLIT % | | | | 39.9% | | 60.1% | | 36.3% | SPLIT % | | | | 55.2% | | 44.8% | | 63.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 663 | 672 | 1,335 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:00 | 07:30 | 11:00 | PM Peak Hour | | | 16:30 | 14:15 | 17:00 |
| AM Pk Volume | | | 54 | 66 | 106 | PM Pk Volume | | | 56 | 55 | 107 |
| Pk Hr Factor | | | 0.711 | 0.786 | 0.914 | Pk Hr Factor | | | 0.824 | 0.809 | 0.892 |
| 7 - 9 Volume | 0 | 0 | 61 | 110 | 171 | 4 - 6 Volume | 0 | 0 | 101 | 83 | 184 |
| 7 - 9 Peak Hour | | | 07:45 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:30 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 40 | 66 | 104 | 4 - 6 Pk Volume | 0 | 0 | 56 | 51 | 107 |
| Pk Hr Factor | 0.000 | 0.000 | 0.667 | 0.786 | 0.897 | Pk Hr Factor | 0.000 | 0.000 | 0.824 | 0.797 | 0.892 |

Prepared by NDS/ATD

# VOLUME

Arlington Dr E/O Sunol Blvd

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_003

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 565 | 549 | 1,114 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 1 | | 1 | | 12:00 | | | 6 | | 11 | | 17 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 14 | | 6 | | 20 | |
| 00:30 | | | 1 | | 3 | | 4 | | 12:30 | | | 14 | | 8 | | 22 | |
| 00:45 | | | 2 | 3 | 0 | 4 | 2 | 7 | 12:45 | | | 14 | 48 | 13 | 38 | 27 | 86 |
| 01:00 | | | 2 | | 0 | | 2 | | 13:00 | | | 13 | | 9 | | 22 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 10 | | 12 | | 22 | |
| 01:30 | | | 2 | | 1 | | 3 | | 13:30 | | | 6 | | 14 | | 20 | |
| 01:45 | | | 0 | 4 | 0 | 1 | 0 | 5 | 13:45 | | | 9 | 38 | 10 | 45 | 19 | 83 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 7 | | 12 | | 19 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 12 | | 8 | | 20 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 12 | | 5 | | 17 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 4 | 35 | 7 | 32 | 11 | 67 |
| 03:00 | | | 1 | | 2 | | 3 | | 15:00 | | | 8 | | 9 | | 17 | |
| 03:15 | | | 1 | | 0 | | 1 | | 15:15 | | | 11 | | 6 | | 17 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 8 | | 3 | | 11 | |
| 03:45 | | | 0 | 2 | 0 | 3 | 0 | 5 | 15:45 | | | 10 | 37 | 8 | 26 | 18 | 63 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 19 | | 9 | | 28 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 7 | | 7 | | 14 | |
| 04:30 | | | 0 | | 0 | | 0 | | 16:30 | | | 9 | | 10 | | 19 | |
| 04:45 | | | 0 | | 1 | 1 | 1 | 1 | 16:45 | | | 7 | 42 | 13 | 39 | 20 | 81 |
| 05:00 | | | 0 | | 1 | | 1 | | 17:00 | | | 9 | | 12 | | 21 | |
| 05:15 | | | 0 | | 2 | | 2 | | 17:15 | | | 7 | | 10 | | 17 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 17 | | 6 | | 23 | |
| 05:45 | | | 0 | | 0 | 3 | 0 | 3 | 17:45 | | | 16 | 49 | 13 | 41 | 29 | 90 |
| 06:00 | | | 1 | | 0 | | 1 | | 18:00 | | | 10 | | 14 | | 24 | |
| 06:15 | | | 1 | | 2 | | 3 | | 18:15 | | | 15 | | 13 | | 28 | |
| 06:30 | | | 2 | | 3 | | 5 | | 18:30 | | | 17 | | 6 | | 23 | |
| 06:45 | | | 1 | 5 | 3 | 8 | 4 | 13 | 18:45 | | | 15 | 57 | 7 | 40 | 22 | 97 |
| 07:00 | | | 0 | | 5 | | 5 | | 19:00 | | | 10 | | 10 | | 20 | |
| 07:15 | | | 2 | | 3 | | 5 | | 19:15 | | | 8 | | 5 | | 13 | |
| 07:30 | | | 4 | | 2 | | 6 | | 19:30 | | | 7 | | 6 | | 13 | |
| 07:45 | | | 4 | 10 | 6 | 16 | 10 | 26 | 19:45 | | | 5 | 30 | 2 | 23 | 7 | 53 |
| 08:00 | | | 2 | | 1 | | 3 | | 20:00 | | | 7 | | 6 | | 13 | |
| 08:15 | | | 4 | | 11 | | 15 | | 20:15 | | | 7 | | 3 | | 10 | |
| 08:30 | | | 5 | | 9 | | 14 | | 20:30 | | | 8 | | 1 | | 9 | |
| 08:45 | | | 5 | 16 | 5 | 26 | 10 | 42 | 20:45 | | | 5 | 27 | 5 | 15 | 10 | 42 |
| 09:00 | | | 5 | | 6 | | 11 | | 21:00 | | | 4 | | 4 | | 8 | |
| 09:15 | | | 7 | | 12 | | 19 | | 21:15 | | | 4 | | 4 | | 8 | |
| 09:30 | | | 9 | | 18 | | 27 | | 21:30 | | | 6 | | 4 | | 10 | |
| 09:45 | | | 10 | 31 | 14 | 50 | 24 | 81 | 21:45 | | | 8 | 22 | 6 | 18 | 14 | 40 |
| 10:00 | | | 10 | | 15 | | 25 | | 22:00 | | | 4 | | 1 | | 5 | |
| 10:15 | | | 4 | | 6 | | 10 | | 22:15 | | | 9 | | 3 | | 12 | |
| 10:30 | | | 4 | | 11 | | 15 | | 22:30 | | | 5 | | 4 | | 9 | |
| 10:45 | | | 14 | 32 | 10 | 42 | 24 | 74 | 22:45 | | | 6 | 24 | 4 | 12 | 10 | 36 |
| 11:00 | | | 8 | | 10 | | 18 | | 23:00 | | | 4 | | 7 | | 11 | |
| 11:15 | | | 11 | | 10 | | 21 | | 23:15 | | | 6 | | 9 | | 15 | |
| 11:30 | | | 10 | | 14 | | 24 | | 23:30 | | | 3 | | 5 | | 8 | |
| 11:45 | | | 7 | 36 | 10 | 44 | 17 | 80 | 23:45 | | | 4 | 17 | 1 | 22 | 5 | 39 |
| TOTALS | | | | 139 | | 198 | | 337 | TOTALS | | | | 426 | | 351 | | 777 |
| SPLIT % | | | | 41.2% | | 58.8% | | 30.3% | SPLIT % | | | | 54.8% | | 45.2% | | 69.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 565 | 549 | 1,114 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 10:45 | 09:15 | 09:15 | PM Peak Hour | | | 17:30 | 12:45 | 17:30 |
| AM Pk Volume | | | 43 | 59 | 95 | PM Pk Volume | | | 58 | 48 | 104 |
| Pk Hr Factor | | | 0.768 | 0.819 | 0.880 | Pk Hr Factor | | | 0.853 | 0.857 | 0.897 |
| 7 - 9 Volume | 0 | 0 | 26 | 42 | 68 | 4 - 6 Volume | 0 | 0 | 91 | 80 | 171 |
| 7 - 9 Peak Hour | | | 08:00 | 07:45 | 07:45 | 4 - 6 Peak Hour | | | 17:00 | 16:30 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 16 | 27 | 42 | 4 - 6 Pk Volume | 0 | 0 | 49 | 45 | 90 |
| Pk Hr Factor | 0.000 | 0.000 | 0.800 | 0.614 | 0.700 | Pk Hr Factor | 0.000 | 0.000 | 0.721 | 0.865 | 0.776 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Sunol Blvd

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_004

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,575 | 1,708 | 3,283 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 2 | | 2 | | 4 | | 12:00 | | | 21 | | 22 | | 43 | |
| 00:15 | | | 3 | | 0 | | 3 | | 12:15 | | | 26 | | 15 | | 41 | |
| 00:30 | | | 1 | | 2 | | 3 | | 12:30 | | | 20 | | 37 | | 57 | |
| 00:45 | | | 2 | 8 | 0 | 4 | 2 | 12 | 12:45 | | | 26 | 93 | 27 | 101 | 53 | 194 |
| 01:00 | | | 2 | | 1 | | 3 | | 13:00 | | | 38 | | 34 | | 72 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 27 | | 28 | | 55 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 25 | | 22 | | 47 | |
| 01:45 | | | 1 | 3 | 0 | 1 | 1 | 4 | 13:45 | | | 23 | 113 | 19 | 103 | 42 | 216 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 24 | | 26 | | 50 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 22 | | 33 | | 55 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 22 | | 31 | | 53 | |
| 02:45 | | | 0 | 2 | 1 | 1 | 1 | 3 | 14:45 | | | 30 | 98 | 35 | 125 | 65 | 223 |
| 03:00 | | | 0 | | 1 | | 1 | | 15:00 | | | 37 | | 47 | | 84 | |
| 03:15 | | | 0 | | 1 | | 1 | | 15:15 | | | 38 | | 41 | | 79 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 31 | | 32 | | 63 | |
| 03:45 | | | 0 | | 1 | 4 | 1 | 4 | 15:45 | | | 31 | 137 | 25 | 145 | 56 | 282 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 30 | | 35 | | 65 | |
| 04:15 | | | 1 | | 1 | | 2 | | 16:15 | | | 32 | | 30 | | 62 | |
| 04:30 | | | 2 | | 3 | | 5 | | 16:30 | | | 33 | | 49 | | 82 | |
| 04:45 | | | 5 | 8 | 3 | 7 | 8 | 15 | 16:45 | | | 24 | 119 | 21 | 135 | 45 | 254 |
| 05:00 | | | 1 | | 1 | | 2 | | 17:00 | | | 34 | | 28 | | 62 | |
| 05:15 | | | 0 | | 2 | | 2 | | 17:15 | | | 20 | | 27 | | 47 | |
| 05:30 | | | 1 | | 8 | | 9 | | 17:30 | | | 29 | | 22 | | 51 | |
| 05:45 | | | 1 | 3 | 7 | 18 | 8 | 21 | 17:45 | | | 39 | 122 | 44 | 121 | 83 | 243 |
| 06:00 | | | 1 | | 6 | | 7 | | 18:00 | | | 31 | | 31 | | 62 | |
| 06:15 | | | 4 | | 6 | | 10 | | 18:15 | | | 22 | | 31 | | 53 | |
| 06:30 | | | 4 | | 9 | | 13 | | 18:30 | | | 32 | | 23 | | 55 | |
| 06:45 | | | 10 | 19 | 24 | 45 | 34 | 64 | 18:45 | | | 29 | 114 | 29 | 114 | 58 | 228 |
| 07:00 | | | 9 | | 19 | | 28 | | 19:00 | | | 39 | | 24 | | 63 | |
| 07:15 | | | 16 | | 32 | | 48 | | 19:15 | | | 30 | | 25 | | 55 | |
| 07:30 | | | 17 | | 59 | | 76 | | 19:30 | | | 30 | | 22 | | 52 | |
| 07:45 | | | 25 | 67 | 46 | 156 | 71 | 223 | 19:45 | | | 29 | 128 | 21 | 92 | 50 | 220 |
| 08:00 | | | 30 | | 61 | | 91 | | 20:00 | | | 30 | | 16 | | 46 | |
| 08:15 | | | 46 | | 40 | | 86 | | 20:15 | | | 17 | | 8 | | 25 | |
| 08:30 | | | 33 | | 22 | | 55 | | 20:30 | | | 16 | | 6 | | 22 | |
| 08:45 | | | 23 | 132 | 41 | 164 | 64 | 296 | 20:45 | | | 27 | 90 | 6 | 36 | 33 | 126 |
| 09:00 | | | 22 | | 32 | | 54 | | 21:00 | | | 11 | | 12 | | 23 | |
| 09:15 | | | 12 | | 21 | | 33 | | 21:15 | | | 10 | | 9 | | 19 | |
| 09:30 | | | 18 | | 19 | | 37 | | 21:30 | | | 12 | | 5 | | 17 | |
| 09:45 | | | 24 | 76 | 26 | 98 | 50 | 174 | 21:45 | | | 17 | 50 | 3 | 29 | 20 | 79 |
| 10:00 | | | 15 | | 20 | | 35 | | 22:00 | | | 10 | | 5 | | 15 | |
| 10:15 | | | 13 | | 30 | | 43 | | 22:15 | | | 8 | | 4 | | 12 | |
| 10:30 | | | 23 | | 19 | | 42 | | 22:30 | | | 6 | | 1 | | 7 | |
| 10:45 | | | 15 | 66 | 23 | 92 | 38 | 158 | 22:45 | | | 4 | 28 | 4 | 14 | 8 | 42 |
| 11:00 | | | 21 | | 22 | | 43 | | 23:00 | | | 4 | | 1 | | 5 | |
| 11:15 | | | 14 | | 19 | | 33 | | 23:15 | | | 8 | | 2 | | 10 | |
| 11:30 | | | 23 | | 23 | | 46 | | 23:30 | | | 1 | | 2 | | 3 | |
| 11:45 | | | 25 | 83 | 33 | 97 | 58 | 180 | 23:45 | | | 3 | 16 | 1 | 6 | 4 | 22 |
| TOTALS | | | | 467 | | 687 | | 1154 | TOTALS | | | | 1108 | | 1021 | | 2129 |
| SPLIT % | | | | 40.5% | | 59.5% | | 35.2% | SPLIT % | | | | 52.0% | | 48.0% | | 64.8% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,575 | 1,708 | 3,283 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:45 | 07:30 | 07:30 | PM Peak Hour | | | 15:00 | 14:45 | 14:45 |
| AM Pk Volume | | | 134 | 206 | 324 | PM Pk Volume | | | 137 | 155 | 291 |
| Pk Hr Factor | | | 0.728 | 0.844 | 0.890 | Pk Hr Factor | | | 0.901 | 0.824 | 0.866 |
| 7 - 9 Volume | 0 | 0 | 199 | 320 | 519 | 4 - 6 Volume | 0 | 0 | 241 | 256 | 497 |
| 7 - 9 Peak Hour | | | 07:45 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:15 | 16:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 134 | 206 | 324 | 4 - 6 Pk Volume | 0 | 0 | 123 | 135 | 254 |
| Pk Hr Factor | 0.000 | 0.000 | 0.728 | 0.844 | 0.890 | Pk Hr Factor | 0.000 | 0.000 | 0.904 | 0.689 | 0.774 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Sunol Blvd

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_004

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,732 | 1,915 | 3,647 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 5 | | 3 | | 8 | | 12:00 | | | 20 | | 42 | | 62 | |
| 00:15 | | | 1 | | 1 | | 2 | | 12:15 | | | 27 | | 38 | | 65 | |
| 00:30 | | | 1 | | 1 | | 2 | | 12:30 | | | 30 | | 30 | | 60 | |
| 00:45 | | | 4 | 11 | 0 | 5 | 4 | 16 | 12:45 | | | 26 | 103 | 25 | 135 | 51 | 238 |
| 01:00 | | | 0 | | 1 | | 1 | | 13:00 | | | 31 | | 35 | | 66 | |
| 01:15 | | | 1 | | 0 | | 1 | | 13:15 | | | 32 | | 20 | | 52 | |
| 01:30 | | | 1 | | 1 | | 2 | | 13:30 | | | 26 | | 29 | | 55 | |
| 01:45 | | | 1 | 3 | 1 | 3 | 2 | 6 | 13:45 | | | 21 | 110 | 28 | 112 | 49 | 222 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 23 | | 25 | | 48 | |
| 02:15 | | | 0 | | 1 | | 1 | | 14:15 | | | 21 | | 28 | | 49 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 22 | | 36 | | 58 | |
| 02:45 | | | 3 | 4 | 2 | 3 | 5 | 7 | 14:45 | | | 30 | 96 | 45 | 134 | 75 | 230 |
| 03:00 | | | 0 | | 1 | | 1 | | 15:00 | | | 50 | | 31 | | 81 | |
| 03:15 | | | 0 | | 1 | | 1 | | 15:15 | | | 60 | | 23 | | 83 | |
| 03:30 | | | 1 | | 1 | | 2 | | 15:30 | | | 28 | | 41 | | 69 | |
| 03:45 | | | 0 | 1 | 0 | 3 | 0 | 4 | 15:45 | | | 31 | 169 | 44 | 139 | 75 | 308 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 29 | | 29 | | 58 | |
| 04:15 | | | 1 | | 1 | | 2 | | 16:15 | | | 23 | | 34 | | 57 | |
| 04:30 | | | 1 | | 1 | | 2 | | 16:30 | | | 31 | | 36 | | 67 | |
| 04:45 | | | 4 | 6 | 2 | 4 | 6 | 10 | 16:45 | | | 35 | 118 | 24 | 123 | 59 | 241 |
| 05:00 | | | 1 | | 2 | | 3 | | 17:00 | | | 36 | | 41 | | 77 | |
| 05:15 | | | 0 | | 4 | | 4 | | 17:15 | | | 35 | | 35 | | 70 | |
| 05:30 | | | 0 | | 3 | | 3 | | 17:30 | | | 35 | | 38 | | 73 | |
| 05:45 | | | 1 | 2 | 4 | 13 | 5 | 15 | 17:45 | | | 32 | 138 | 34 | 148 | 66 | 286 |
| 06:00 | | | 1 | | 6 | | 7 | | 18:00 | | | 39 | | 31 | | 70 | |
| 06:15 | | | 3 | | 10 | | 13 | | 18:15 | | | 29 | | 46 | | 75 | |
| 06:30 | | | 10 | | 13 | | 23 | | 18:30 | | | 23 | | 29 | | 52 | |
| 06:45 | | | 9 | 23 | 12 | 41 | 21 | 64 | 18:45 | | | 30 | 121 | 44 | 150 | 74 | 271 |
| 07:00 | | | 15 | | 12 | | 27 | | 19:00 | | | 30 | | 31 | | 61 | |
| 07:15 | | | 17 | | 26 | | 43 | | 19:15 | | | 29 | | 30 | | 59 | |
| 07:30 | | | 19 | | 74 | | 93 | | 19:30 | | | 21 | | 34 | | 55 | |
| 07:45 | | | 31 | 82 | 50 | 162 | 81 | 244 | 19:45 | | | 20 | 100 | 13 | 108 | 33 | 208 |
| 08:00 | | | 35 | | 68 | | 103 | | 20:00 | | | 24 | | 11 | | 35 | |
| 08:15 | | | 34 | | 33 | | 67 | | 20:15 | | | 24 | | 19 | | 43 | |
| 08:30 | | | 33 | | 27 | | 60 | | 20:30 | | | 20 | | 17 | | 37 | |
| 08:45 | | | 23 | 125 | 20 | 148 | 43 | 273 | 20:45 | | | 27 | 95 | 12 | 59 | 39 | 154 |
| 09:00 | | | 28 | | 34 | | 62 | | 21:00 | | | 21 | | 12 | | 33 | |
| 09:15 | | | 19 | | 28 | | 47 | | 21:15 | | | 16 | | 7 | | 23 | |
| 09:30 | | | 24 | | 22 | | 46 | | 21:30 | | | 12 | | 13 | | 25 | |
| 09:45 | | | 21 | 92 | 41 | 125 | 62 | 217 | 21:45 | | | 16 | 65 | 11 | 43 | 27 | 108 |
| 10:00 | | | 28 | | 24 | | 52 | | 22:00 | | | 21 | | 9 | | 30 | |
| 10:15 | | | 13 | | 26 | | 39 | | 22:15 | | | 16 | | 7 | | 23 | |
| 10:30 | | | 24 | | 35 | | 59 | | 22:30 | | | 10 | | 9 | | 19 | |
| 10:45 | | | 28 | 93 | 18 | 103 | 46 | 196 | 22:45 | | | 11 | 58 | 3 | 28 | 14 | 86 |
| 11:00 | | | 27 | | 27 | | 54 | | 23:00 | | | 6 | | 2 | | 8 | |
| 11:15 | | | 19 | | 33 | | 52 | | 23:15 | | | 7 | | 2 | | 9 | |
| 11:30 | | | 26 | | 30 | | 56 | | 23:30 | | | 4 | | 3 | | 7 | |
| 11:45 | | | 21 | 93 | 27 | 117 | 48 | 210 | 23:45 | | | 7 | 24 | 2 | 9 | 9 | 33 |
| TOTALS | | | | 535 | | 727 | | 1262 | TOTALS | | | | 1197 | | 1188 | | 2385 |
| SPLIT % | | | | 42.4% | | 57.6% | | 34.6% | SPLIT % | | | | 50.2% | | 49.8% | | 65.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,732 | 1,915 | 3,647 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:45 | 07:30 | 07:30 | PM Peak Hour | | | 15:00 | 18:00 | 14:45 |
| AM Pk Volume | | | 133 | 225 | 344 | PM Pk Volume | | | 169 | 150 | 308 |
| Pk Hr Factor | | | 0.950 | 0.760 | 0.835 | Pk Hr Factor | | | 0.704 | 0.815 | 0.928 |
| 7 - 9 Volume | 0 | 0 | 207 | 310 | 517 | 4 - 6 Volume | 0 | 0 | 256 | 271 | 527 |
| 7 - 9 Peak Hour | | | 07:45 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:45 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 133 | 225 | 344 | 4 - 6 Pk Volume | 0 | 0 | 141 | 148 | 286 |
| Pk Hr Factor | 0.000 | 0.000 | 0.950 | 0.760 | 0.835 | Pk Hr Factor | 0.000 | 0.000 | 0.979 | 0.902 | 0.929 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Sunol Blvd

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_004

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,397 | 1,545 | 2,942 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 6 | | 3 | | 9 | | 12:00 | | | 35 | | 26 | | 61 | |
| 00:15 | | | 2 | | 5 | | 7 | | 12:15 | | | 35 | | 29 | | 64 | |
| 00:30 | | | 4 | | 1 | | 5 | | 12:30 | | | 18 | | 18 | | 36 | |
| 00:45 | | | 3 | 15 | 2 | 11 | 5 | 26 | 12:45 | | | 23 | 111 | 28 | 101 | 51 | 212 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 23 | | 35 | | 58 | |
| 01:15 | | | 1 | | 1 | | 2 | | 13:15 | | | 29 | | 25 | | 54 | |
| 01:30 | | | 1 | | 0 | | 1 | | 13:30 | | | 27 | | 21 | | 48 | |
| 01:45 | | | 2 | 5 | 2 | 3 | 4 | 8 | 13:45 | | | 24 | 103 | 24 | 105 | 48 | 208 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 22 | | 23 | | 45 | |
| 02:15 | | | 2 | | 1 | | 3 | | 14:15 | | | 25 | | 34 | | 59 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 22 | | 15 | | 37 | |
| 02:45 | | | 1 | 5 | 0 | 1 | 1 | 6 | 14:45 | | | 48 | 117 | 21 | 93 | 69 | 210 |
| 03:00 | | | 1 | | 2 | | 3 | | 15:00 | | | 28 | | 19 | | 47 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 23 | | 32 | | 55 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 32 | | 31 | | 63 | |
| 03:45 | | | 0 | 1 | 1 | 3 | 1 | 4 | 15:45 | | | 25 | 108 | 34 | 116 | 59 | 224 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 31 | | 16 | | 47 | |
| 04:15 | | | 2 | | 0 | | 2 | | 16:15 | | | 27 | | 19 | | 46 | |
| 04:30 | | | 0 | | 0 | | 0 | | 16:30 | | | 22 | | 27 | | 49 | |
| 04:45 | | | 2 | 4 | 0 | | 2 | 4 | 16:45 | | | 28 | 108 | 42 | 104 | 70 | 212 |
| 05:00 | | | 0 | | 1 | | 1 | | 17:00 | | | 19 | | 27 | | 46 | |
| 05:15 | | | 0 | | 2 | | 2 | | 17:15 | | | 17 | | 20 | | 37 | |
| 05:30 | | | 1 | | 1 | | 2 | | 17:30 | | | 23 | | 22 | | 45 | |
| 05:45 | | | 1 | 2 | 0 | 4 | 1 | 6 | 17:45 | | | 30 | 89 | 25 | 94 | 55 | 183 |
| 06:00 | | | 0 | | 3 | | 3 | | 18:00 | | | 30 | | 32 | | 62 | |
| 06:15 | | | 3 | | 3 | | 6 | | 18:15 | | | 24 | | 21 | | 45 | |
| 06:30 | | | 6 | | 7 | | 13 | | 18:30 | | | 22 | | 24 | | 46 | |
| 06:45 | | | 3 | 12 | 4 | 17 | 7 | 29 | 18:45 | | | 23 | 99 | 27 | 104 | 50 | 203 |
| 07:00 | | | 9 | | 7 | | 16 | | 19:00 | | | 26 | | 30 | | 56 | |
| 07:15 | | | 3 | | 6 | | 9 | | 19:15 | | | 20 | | 28 | | 48 | |
| 07:30 | | | 6 | | 16 | | 22 | | 19:30 | | | 24 | | 18 | | 42 | |
| 07:45 | | | 11 | 29 | 18 | 47 | 29 | 76 | 19:45 | | | 15 | 85 | 24 | 100 | 39 | 185 |
| 08:00 | | | 14 | | 23 | | 37 | | 20:00 | | | 7 | | 12 | | 19 | |
| 08:15 | | | 13 | | 23 | | 36 | | 20:15 | | | 20 | | 14 | | 34 | |
| 08:30 | | | 11 | | 22 | | 33 | | 20:30 | | | 22 | | 10 | | 32 | |
| 08:45 | | | 10 | 48 | 24 | 92 | 34 | 140 | 20:45 | | | 13 | 62 | 19 | 55 | 32 | 117 |
| 09:00 | | | 15 | | 25 | | 40 | | 21:00 | | | 10 | | 11 | | 21 | |
| 09:15 | | | 31 | | 35 | | 66 | | 21:15 | | | 16 | | 20 | | 36 | |
| 09:30 | | | 16 | | 32 | | 48 | | 21:30 | | | 14 | | 6 | | 20 | |
| 09:45 | | | 13 | 75 | 50 | 142 | 63 | 217 | 21:45 | | | 18 | 58 | 13 | 50 | 31 | 108 |
| 10:00 | | | 22 | | 21 | | 43 | | 22:00 | | | 12 | | 14 | | 26 | |
| 10:15 | | | 25 | | 25 | | 50 | | 22:15 | | | 18 | | 10 | | 28 | |
| 10:30 | | | 26 | | 30 | | 56 | | 22:30 | | | 7 | | 4 | | 11 | |
| 10:45 | | | 10 | 83 | 35 | 111 | 45 | 194 | 22:45 | | | 23 | 60 | 16 | 44 | 39 | 104 |
| 11:00 | | | 20 | | 20 | | 40 | | 23:00 | | | 7 | | 7 | | 14 | |
| 11:15 | | | 21 | | 33 | | 54 | | 23:15 | | | 11 | | 5 | | 16 | |
| 11:30 | | | 21 | | 28 | | 49 | | 23:30 | | | 8 | | 6 | | 14 | |
| 11:45 | | | 25 | 87 | 37 | 118 | 62 | 205 | 23:45 | | | 5 | 31 | 12 | 30 | 17 | 61 |
| TOTALS | | | | 366 | | 549 | | 915 | TOTALS | | | | 1031 | | 996 | | 2027 |
| SPLIT % | | | | 40.0% | | 60.0% | | 31.1% | SPLIT % | | | | 50.9% | | 49.1% | | 68.9% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 1,397 | 1,545 | 2,942 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:30 | 09:00 | 11:30 | PM Peak Hour | | | 14:45 | 15:00 | 14:45 |
| AM Pk Volume | | | 116 | 142 | 236 | PM Pk Volume | | | 131 | 116 | 234 |
| Pk Hr Factor | | | 0.829 | 0.710 | 0.922 | Pk Hr Factor | | | 0.682 | 0.853 | 0.848 |
| 7 - 9 Volume | 0 | 0 | 77 | 139 | 216 | 4 - 6 Volume | 0 | 0 | 197 | 198 | 395 |
| 7 - 9 Peak Hour | | | 07:45 | 08:00 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 16:30 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 49 | 92 | 140 | 4 - 6 Pk Volume | 0 | 0 | 108 | 116 | 212 |
| Pk Hr Factor | 0.000 | 0.000 | 0.875 | 0.958 | 0.946 | Pk Hr Factor | 0.000 | 0.000 | 0.871 | 0.690 | 0.757 |

Prepared by NDS/ATD

# VOLUME

Sycamore Rd E/O Sycamore Creek Way

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_005

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 738 | 647 | 0 | 0 | 1,385 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 1 | | | | | | 1 | | 12:00 | 12 | | 8 | | | | | | 20 | |
| 00:15 | 0 | | 1 | | | | | | 1 | | 12:15 | 7 | | 16 | | | | | | 23 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 11 | | 9 | | | | | | 20 | |
| 00:45 | 0 | | 1 | 3 | | | | | 1 | 3 | 12:45 | 11 | 41 | 9 | 42 | | | | | 20 | 83 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 15 | | 15 | | | | | | 30 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 9 | | 16 | | | | | | 25 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 15 | | 15 | | | | | | 30 | |
| 01:45 | 0 | | 0 | | | | | | 0 | | 13:45 | 7 | 46 | 7 | 53 | | | | | 14 | 99 |
| 02:00 | 0 | | 1 | | | | | | 1 | | 14:00 | 10 | | 12 | | | | | | 22 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 12 | | 12 | | | | | | 24 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 12 | | 6 | | | | | | 18 | |
| 02:45 | 0 | | 0 | 1 | | | | | 0 | 1 | 14:45 | 27 | 61 | 17 | 47 | | | | | 44 | 108 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 27 | | 13 | | | | | | 40 | |
| 03:15 | 1 | | 0 | | | | | | 1 | | 15:15 | 32 | | 12 | | | | | | 44 | |
| 03:30 | 1 | | 0 | | | | | | 1 | | 15:30 | 15 | | 10 | | | | | | 25 | |
| 03:45 | 0 | 2 | 0 | | | | | | 0 | 2 | 15:45 | 13 | 87 | 13 | 48 | | | | | 26 | 135 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 18 | | 14 | | | | | | 32 | |
| 04:15 | 0 | | 1 | | | | | | 1 | | 16:15 | 10 | | 8 | | | | | | 18 | |
| 04:30 | 2 | | 0 | | | | | | 2 | | 16:30 | 30 | | 15 | | | | | | 45 | |
| 04:45 | 1 | 3 | 5 | 6 | | | | | 6 | 9 | 16:45 | 6 | 64 | 12 | 49 | | | | | 18 | 113 |
| 05:00 | 0 | | 0 | | | | | | 0 | | 17:00 | 8 | | 19 | | | | | | 27 | |
| 05:15 | 1 | | 0 | | | | | | 1 | | 17:15 | 13 | | 10 | | | | | | 23 | |
| 05:30 | 2 | | 1 | | | | | | 3 | | 17:30 | 8 | | 6 | | | | | | 14 | |
| 05:45 | 2 | 5 | 1 | 2 | | | | | 3 | 7 | 17:45 | 25 | 54 | 12 | 47 | | | | | 37 | 101 |
| 06:00 | 2 | | 2 | | | | | | 4 | | 18:00 | 15 | | 10 | | | | | | 25 | |
| 06:15 | 2 | | 3 | | | | | | 5 | | 18:15 | 16 | | 10 | | | | | | 26 | |
| 06:30 | 1 | | 4 | | | | | | 5 | | 18:30 | 14 | | 11 | | | | | | 25 | |
| 06:45 | 7 | 12 | 4 | 13 | | | | | 11 | 25 | 18:45 | 11 | 56 | 13 | 44 | | | | | 24 | 100 |
| 07:00 | 11 | | 6 | | | | | | 17 | | 19:00 | 11 | | 13 | | | | | | 24 | |
| 07:15 | 10 | | 9 | | | | | | 19 | | 19:15 | 11 | | 12 | | | | | | 23 | |
| 07:30 | 15 | | 9 | | | | | | 24 | | 19:30 | 8 | | 12 | | | | | | 20 | |
| 07:45 | 21 | 57 | 13 | 37 | | | | | 34 | 94 | 19:45 | 8 | 38 | 7 | 44 | | | | | 15 | 82 |
| 08:00 | 20 | | 10 | | | | | | 30 | | 20:00 | 10 | | 10 | | | | | | 20 | |
| 08:15 | 11 | | 18 | | | | | | 29 | | 20:15 | 3 | | 4 | | | | | | 7 | |
| 08:30 | 8 | | 13 | | | | | | 21 | | 20:30 | 3 | | 5 | | | | | | 8 | |
| 08:45 | 20 | 59 | 9 | 50 | | | | | 29 | 109 | 20:45 | 4 | 20 | 7 | 26 | | | | | 11 | 46 |
| 09:00 | 9 | | 11 | | | | | | 20 | | 21:00 | 6 | | 4 | | | | | | 10 | |
| 09:15 | 9 | | 7 | | | | | | 16 | | 21:15 | 5 | | 3 | | | | | | 8 | |
| 09:30 | 5 | | 7 | | | | | | 12 | | 21:30 | 1 | | 3 | | | | | | 4 | |
| 09:45 | 4 | 27 | 14 | 39 | | | | | 18 | 66 | 21:45 | 2 | 14 | 8 | 18 | | | | | 10 | 32 |
| 10:00 | 8 | | 9 | | | | | | 17 | | 22:00 | 3 | | 4 | | | | | | 7 | |
| 10:15 | 13 | | 3 | | | | | | 16 | | 22:15 | 3 | | 3 | | | | | | 6 | |
| 10:30 | 6 | | 9 | | | | | | 15 | | 22:30 | 1 | | 2 | | | | | | 3 | |
| 10:45 | 13 | 40 | 8 | 29 | | | | | 21 | 69 | 22:45 | 2 | 9 | 2 | 11 | | | | | 4 | 20 |
| 11:00 | 7 | | 8 | | | | | | 15 | | 23:00 | 2 | | 3 | | | | | | 5 | |
| 11:15 | 9 | | 8 | | | | | | 17 | | 23:15 | 2 | | 3 | | | | | | 5 | |
| 11:30 | 7 | | 5 | | | | | | 12 | | 23:30 | 2 | | 3 | | | | | | 5 | |
| 11:45 | 13 | 36 | 7 | 28 | | | | | 20 | 64 | 23:45 | 1 | 7 | 1 | 10 | | | | | 2 | 17 |
| TOTALS | | 241 | | 208 | | | | | | 449 | TOTALS | | 497 | | 439 | | | | | | 936 |
| SPLIT % | | 53.7% | | 46.3% | | | | | | 32.4% | SPLIT % | | 53.1% | | 46.9% | | | | | | 67.6% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 738 | 647 | 0 | 0 | 1,385 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 07:30 | 07:45 | | | 07:30 | PM Peak Hour | 14:45 | 16:30 | | | 14:45 |
| AM Pk Volume | 67 | 54 | | | 117 | PM Pk Volume | 101 | 56 | | | 153 |
| Pk Hr Factor | 0.798 | 0.750 | | | 0.860 | Pk Hr Factor | 0.789 | 0.737 | | | 0.869 |
| 7 - 9 Volume | 116 | 87 | 0 | 0 | 203 | 4 - 6 Volume | 118 | 96 | 0 | 0 | 214 |
| 7 - 9 Peak Hour | 07:30 | 07:45 | | | 07:30 | 4 - 6 Peak Hour | 16:00 | 16:30 | | | 16:00 |
| 7 - 9 Pk Volume | 67 | 54 | 0 | 0 | 117 | 4 - 6 Pk Volume | 64 | 56 | 0 | 0 | 113 |
| Pk Hr Factor | 0.798 | 0.750 | 0.000 | 0.000 | 0.860 | Pk Hr Factor | 0.533 | 0.737 | 0.000 | 0.000 | 0.628 |

Prepared by NDS/ATD

# VOLUME

Sycamore Rd E/O Sycamore Creek Way

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_005

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 844 | 708 | 0 | 0 | 1,552 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 2 | | 0 | | | | | | 2 | | 12:00 | 19 | | 9 | | | | | | 28 | |
| 00:15 | 1 | | 0 | | | | | | 1 | | 12:15 | 18 | | 10 | | | | | | 28 | |
| 00:30 | 0 | | 1 | | | | | | 1 | | 12:30 | 15 | | 18 | | | | | | 33 | |
| 00:45 | 0 | 3 | 3 | 4 | | | | | 3 | 7 | 12:45 | 7 | 59 | 17 | 54 | | | | | 24 | 113 |
| 01:00 | 1 | | 0 | | | | | | 1 | | 13:00 | 20 | | 12 | | | | | | 32 | |
| 01:15 | 0 | | 1 | | | | | | 1 | | 13:15 | 17 | | 15 | | | | | | 32 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 18 | | 11 | | | | | | 29 | |
| 01:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 13:45 | 10 | 65 | 12 | 50 | | | | | 22 | 115 |
| 02:00 | 0 | | 1 | | | | | | 1 | | 14:00 | 9 | | 6 | | | | | | 15 | |
| 02:15 | 1 | | 0 | | | | | | 1 | | 14:15 | 17 | | 7 | | | | | | 24 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 10 | | 11 | | | | | | 21 | |
| 02:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 14:45 | 19 | 55 | 6 | 30 | | | | | 25 | 85 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 13 | | 18 | | | | | | 31 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 10 | | 19 | | | | | | 29 | |
| 03:30 | 1 | | 1 | | | | | | 2 | | 15:30 | 18 | | 5 | | | | | | 23 | |
| 03:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 15:45 | 16 | 57 | 21 | 63 | | | | | 37 | 120 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 16 | | 10 | | | | | | 26 | |
| 04:15 | 0 | | 1 | | | | | | 1 | | 16:15 | 19 | | 9 | | | | | | 28 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 15 | | 9 | | | | | | 24 | |
| 04:45 | 2 | 2 | 3 | 4 | | | | | 5 | 6 | 16:45 | 8 | 58 | 14 | 42 | | | | | 22 | 100 |
| 05:00 | 2 | | 0 | | | | | | 2 | | 17:00 | 13 | | 11 | | | | | | 24 | |
| 05:15 | 1 | | 0 | | | | | | 1 | | 17:15 | 17 | | 18 | | | | | | 35 | |
| 05:30 | 0 | | 0 | | | | | | 0 | | 17:30 | 17 | | 14 | | | | | | 31 | |
| 05:45 | 1 | 4 | 0 | | | | | | 1 | 4 | 17:45 | 16 | 63 | 9 | 52 | | | | | 25 | 115 |
| 06:00 | 3 | | 1 | | | | | | 4 | | 18:00 | 13 | | 10 | | | | | | 23 | |
| 06:15 | 2 | | 3 | | | | | | 5 | | 18:15 | 26 | | 9 | | | | | | 35 | |
| 06:30 | 5 | | 4 | | | | | | 9 | | 18:30 | 17 | | 12 | | | | | | 29 | |
| 06:45 | 6 | 16 | 7 | 15 | | | | | 13 | 31 | 18:45 | 20 | 76 | 12 | 43 | | | | | 32 | 119 |
| 07:00 | 6 | | 11 | | | | | | 17 | | 19:00 | 15 | | 8 | | | | | | 23 | |
| 07:15 | 10 | | 12 | | | | | | 22 | | 19:15 | 12 | | 6 | | | | | | 18 | |
| 07:30 | 19 | | 8 | | | | | | 27 | | 19:30 | 21 | | 4 | | | | | | 25 | |
| 07:45 | 23 | 58 | 10 | 41 | | | | | 33 | 99 | 19:45 | 6 | 54 | 8 | 26 | | | | | 14 | 80 |
| 08:00 | 19 | | 18 | | | | | | 37 | | 20:00 | 4 | | 7 | | | | | | 11 | |
| 08:15 | 15 | | 9 | | | | | | 24 | | 20:15 | 1 | | 9 | | | | | | 10 | |
| 08:30 | 13 | | 18 | | | | | | 31 | | 20:30 | 9 | | 9 | | | | | | 18 | |
| 08:45 | 8 | 55 | 10 | 55 | | | | | 18 | 110 | 20:45 | 4 | 18 | 9 | 34 | | | | | 13 | 52 |
| 09:00 | 17 | | 16 | | | | | | 33 | | 21:00 | 5 | | 8 | | | | | | 13 | |
| 09:15 | 13 | | 11 | | | | | | 24 | | 21:15 | 6 | | 7 | | | | | | 13 | |
| 09:30 | 6 | | 15 | | | | | | 21 | | 21:30 | 8 | | 4 | | | | | | 12 | |
| 09:45 | 15 | 51 | 11 | 53 | | | | | 26 | 104 | 21:45 | 5 | 24 | 6 | 25 | | | | | 11 | 49 |
| 10:00 | 7 | | 13 | | | | | | 20 | | 22:00 | 4 | | 8 | | | | | | 12 | |
| 10:15 | 8 | | 9 | | | | | | 17 | | 22:15 | 5 | | 3 | | | | | | 8 | |
| 10:30 | 15 | | 12 | | | | | | 27 | | 22:30 | 4 | | 2 | | | | | | 6 | |
| 10:45 | 11 | 41 | 10 | 44 | | | | | 21 | 85 | 22:45 | 1 | 14 | 1 | 14 | | | | | 2 | 28 |
| 11:00 | 14 | | 15 | | | | | | 29 | | 23:00 | 1 | | 2 | | | | | | 3 | |
| 11:15 | 23 | | 11 | | | | | | 34 | | 23:15 | 2 | | 3 | | | | | | 5 | |
| 11:30 | 11 | | 9 | | | | | | 20 | | 23:30 | 2 | | 2 | | | | | | 4 | |
| 11:45 | 14 | 62 | 10 | 45 | | | | | 24 | 107 | 23:45 | 1 | 6 | 4 | 11 | | | | | 5 | 17 |
| TOTALS | | 295 | | 264 | | | | | | 559 | TOTALS | | 549 | | 444 | | | | | | 993 |
| SPLIT % | | 52.8% | | 47.2% | | | | | | 36.0% | SPLIT % | | 55.3% | | 44.7% | | | | | | 64.0% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 844 | 708 | 0 | 0 | 1,552 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 07:30 | 07:45 | | | 07:45 | PM Peak Hour | 18:15 | 15:00 | | | 12:30 |
| AM Pk Volume | 76 | 55 | | | 125 | PM Pk Volume | 78 | 63 | | | 121 |
| Pk Hr Factor | 0.826 | 0.764 | | | 0.845 | Pk Hr Factor | 0.750 | 0.750 | | | 0.917 |
| 7 - 9 Volume | 113 | 96 | 0 | 0 | 209 | 4 - 6 Volume | 121 | 94 | 0 | 0 | 215 |
| 7 - 9 Peak Hour | 07:30 | 07:45 | | | 07:45 | 4 - 6 Peak Hour | 17:00 | 16:45 | | | 17:00 |
| 7 - 9 Pk Volume | 76 | 55 | 0 | 0 | 125 | 4 - 6 Pk Volume | 63 | 57 | 0 | 0 | 115 |
| Pk Hr Factor | 0.826 | 0.764 | 0.000 | 0.000 | 0.845 | Pk Hr Factor | 0.926 | 0.792 | 0.000 | 0.000 | 0.821 |

Prepared by NDS/ATD

# VOLUME

Sycamore Rd E/O Sycamore Creek Way

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_005

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 696 | 578 | 0 | 0 | 1,274 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 2 | | 4 | | | | | | 6 | | 12:00 | 10 | | 12 | | | | | | 22 | |
| 00:15 | 1 | | 0 | | | | | | 1 | | 12:15 | 12 | | 12 | | | | | | 24 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 8 | | 6 | | | | | | 14 | |
| 00:45 | 0 | 3 | 0 | 4 | | | | | 0 | 7 | 12:45 | 9 | 39 | 9 | 39 | | | | | 18 | 78 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 12 | | 11 | | | | | | 23 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 9 | | 12 | | | | | | 21 | |
| 01:30 | 1 | | 0 | | | | | | 1 | | 13:30 | 6 | | 10 | | | | | | 16 | |
| 01:45 | 0 | 1 | 0 | | | | | | 0 | 1 | 13:45 | 12 | 39 | 9 | 42 | | | | | 21 | 81 |
| 02:00 | 0 | | 0 | | | | | | 0 | | 14:00 | 10 | | 6 | | | | | | 16 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 15 | | 9 | | | | | | 24 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 10 | | 14 | | | | | | 24 | |
| 02:45 | 0 | | 0 | | | | | | 0 | | 14:45 | 12 | 47 | 16 | 45 | | | | | 28 | 92 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 8 | | 11 | | | | | | 19 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 15 | | 14 | | | | | | 29 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 9 | | 15 | | | | | | 24 | |
| 03:45 | 1 | 1 | 0 | | | | | | 1 | 1 | 15:45 | 12 | 44 | 14 | 54 | | | | | 26 | 98 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 10 | | 15 | | | | | | 25 | |
| 04:15 | 0 | | 2 | | | | | | 2 | | 16:15 | 9 | | 15 | | | | | | 24 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 14 | | 7 | | | | | | 21 | |
| 04:45 | 0 | | 2 | 4 | | | | | 2 | 4 | 16:45 | 27 | 60 | 10 | 47 | | | | | 37 | 107 |
| 05:00 | 0 | | 0 | | | | | | 0 | | 17:00 | 12 | | 5 | | | | | | 17 | |
| 05:15 | 1 | | 0 | | | | | | 1 | | 17:15 | 10 | | 7 | | | | | | 17 | |
| 05:30 | 0 | | 0 | | | | | | 0 | | 17:30 | 6 | | 5 | | | | | | 11 | |
| 05:45 | 0 | 1 | 1 | 1 | | | | | 1 | 2 | 17:45 | 14 | 42 | 12 | 29 | | | | | 26 | 71 |
| 06:00 | 1 | | 0 | | | | | | 1 | | 18:00 | 11 | | 9 | | | | | | 20 | |
| 06:15 | 0 | | 3 | | | | | | 3 | | 18:15 | 8 | | 6 | | | | | | 14 | |
| 06:30 | 4 | | 4 | | | | | | 8 | | 18:30 | 11 | | 11 | | | | | | 22 | |
| 06:45 | 1 | 6 | 2 | 9 | | | | | 3 | 15 | 18:45 | 16 | 46 | 6 | 32 | | | | | 22 | 78 |
| 07:00 | 2 | | 3 | | | | | | 5 | | 19:00 | 18 | | 11 | | | | | | 29 | |
| 07:15 | 1 | | 1 | | | | | | 2 | | 19:15 | 17 | | 8 | | | | | | 25 | |
| 07:30 | 6 | | 3 | | | | | | 9 | | 19:30 | 10 | | 6 | | | | | | 16 | |
| 07:45 | 8 | 17 | 5 | 12 | | | | | 13 | 29 | 19:45 | 14 | 59 | 6 | 31 | | | | | 20 | 90 |
| 08:00 | 9 | | 9 | | | | | | 18 | | 20:00 | 6 | | 3 | | | | | | 9 | |
| 08:15 | 11 | | 4 | | | | | | 15 | | 20:15 | 5 | | 8 | | | | | | 13 | |
| 08:30 | 10 | | 8 | | | | | | 18 | | 20:30 | 8 | | 11 | | | | | | 19 | |
| 08:45 | 11 | 41 | 6 | 27 | | | | | 17 | 68 | 20:45 | 6 | 25 | 4 | 26 | | | | | 10 | 51 |
| 09:00 | 11 | | 5 | | | | | | 16 | | 21:00 | 7 | | 3 | | | | | | 10 | |
| 09:15 | 7 | | 20 | | | | | | 27 | | 21:15 | 19 | | 6 | | | | | | 25 | |
| 09:30 | 12 | | 6 | | | | | | 18 | | 21:30 | 2 | | 9 | | | | | | 11 | |
| 09:45 | 31 | 61 | 4 | 35 | | | | | 35 | 96 | 21:45 | 9 | 37 | 7 | 25 | | | | | 16 | 62 |
| 10:00 | 3 | | 11 | | | | | | 14 | | 22:00 | 4 | | 5 | | | | | | 9 | |
| 10:15 | 15 | | 10 | | | | | | 25 | | 22:15 | 5 | | 5 | | | | | | 10 | |
| 10:30 | 8 | | 10 | | | | | | 18 | | 22:30 | 3 | | 1 | | | | | | 4 | |
| 10:45 | 15 | 41 | 10 | 41 | | | | | 25 | 82 | 22:45 | 7 | 19 | 7 | 18 | | | | | 14 | 37 |
| 11:00 | 10 | | 11 | | | | | | 21 | | 23:00 | 5 | | 4 | | | | | | 9 | |
| 11:15 | 15 | | 10 | | | | | | 25 | | 23:15 | 3 | | 6 | | | | | | 9 | |
| 11:30 | 12 | | 7 | | | | | | 19 | | 23:30 | 3 | | 3 | | | | | | 6 | |
| 11:45 | 16 | 53 | 13 | 41 | | | | | 29 | 94 | 23:45 | 3 | 14 | 3 | 16 | | | | | 6 | 30 |
| TOTALS | | 225 | | 174 | | | | | | 399 | TOTALS | | 471 | | 404 | | | | | | 875 |
| SPLIT % | | 56.4% | | 43.6% | | | | | | 31.3% | SPLIT % | | 53.8% | | 46.2% | | | | | | 68.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 696 | 578 | 0 | 0 | 1,274 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 09:00 | 11:30 | | | 09:00 | PM Peak Hour | 16:30 | 15:30 | | | 16:00 |
| AM Pk Volume | 61 | 44 | | | 96 | PM Pk Volume | 63 | 59 | | | 107 |
| Pk Hr Factor | 0.492 | 0.846 | | | 0.686 | Pk Hr Factor | 0.583 | 0.983 | | | 0.723 |
| 7 - 9 Volume | 58 | 39 | 0 | 0 | 97 | 4 - 6 Volume | 102 | 76 | 0 | 0 | 178 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | | 08:00 | 4 - 6 Peak Hour | 16:30 | 16:00 | | | 16:00 |
| 7 - 9 Pk Volume | 41 | 27 | 0 | 0 | 68 | 4 - 6 Pk Volume | 63 | 47 | 0 | 0 | 107 |
| Pk Hr Factor | 0.932 | 0.750 | 0.000 | 0.000 | 0.944 | Pk Hr Factor | 0.583 | 0.783 | 0.000 | 0.000 | 0.723 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way W/O Summit Creek Ln

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_006

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 693 | 694 | 1,387 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 0 | | 1 | | 12:00 | | | 8 | | 9 | | 17 | |
| 00:15 | | | 2 | | 0 | | 2 | | 12:15 | | | 8 | | 5 | | 13 | |
| 00:30 | | | 1 | | 2 | | 3 | | 12:30 | | | 7 | | 16 | | 23 | |
| 00:45 | | | 0 | 4 | 0 | 2 | 0 | 6 | 12:45 | | | 10 | 33 | 7 | 37 | 17 | 70 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 11 | | 7 | | 18 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 7 | | 7 | | 14 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 7 | | 3 | | 10 | |
| 01:45 | | | 0 | 1 | 0 | | 0 | 1 | 13:45 | | | 8 | 33 | 10 | 27 | 18 | 60 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 13 | | 13 | | 26 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 8 | | 14 | | 22 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 10 | | 14 | | 24 | |
| 02:45 | | | 0 | 2 | 1 | 1 | 1 | 3 | 14:45 | | | 6 | 37 | 6 | 47 | 12 | 84 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 21 | | 13 | | 34 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 25 | | 9 | | 34 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 13 | | 8 | | 21 | |
| 03:45 | | | 0 | | 1 | 1 | 1 | 1 | 15:45 | | | 14 | 73 | 12 | 42 | 26 | 115 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 12 | | 18 | | 30 | |
| 04:15 | | | 0 | | 1 | | 1 | | 16:15 | | | 16 | | 10 | | 26 | |
| 04:30 | | | 1 | | 4 | | 5 | | 16:30 | | | 13 | | 11 | | 24 | |
| 04:45 | | | 0 | 1 | 2 | 7 | 2 | 8 | 16:45 | | | 11 | 52 | 9 | 48 | 20 | 100 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 10 | | 18 | | 28 | |
| 05:15 | | | 0 | | 1 | | 1 | | 17:15 | | | 9 | | 10 | | 19 | |
| 05:30 | | | 0 | | 6 | | 6 | | 17:30 | | | 15 | | 12 | | 27 | |
| 05:45 | | | 0 | 1 | 1 | 8 | 1 | 9 | 17:45 | | | 17 | 51 | 16 | 56 | 33 | 107 |
| 06:00 | | | 1 | | 3 | | 4 | | 18:00 | | | 21 | | 7 | | 28 | |
| 06:15 | | | 0 | | 4 | | 4 | | 18:15 | | | 10 | | 11 | | 21 | |
| 06:30 | | | 0 | | 4 | | 4 | | 18:30 | | | 14 | | 6 | | 20 | |
| 06:45 | | | 2 | 3 | 11 | 22 | 13 | 25 | 18:45 | | | 17 | 62 | 17 | 41 | 34 | 103 |
| 07:00 | | | 2 | | 6 | | 8 | | 19:00 | | | 15 | | 7 | | 22 | |
| 07:15 | | | 2 | | 17 | | 19 | | 19:15 | | | 15 | | 10 | | 25 | |
| 07:30 | | | 11 | | 34 | | 45 | | 19:30 | | | 14 | | 8 | | 22 | |
| 07:45 | | | 12 | 27 | 18 | 75 | 30 | 102 | 19:45 | | | 20 | 64 | 10 | 35 | 30 | 99 |
| 08:00 | | | 11 | | 33 | | 44 | | 20:00 | | | 15 | | 5 | | 20 | |
| 08:15 | | | 21 | | 24 | | 45 | | 20:15 | | | 15 | | 3 | | 18 | |
| 08:30 | | | 11 | | 9 | | 20 | | 20:30 | | | 9 | | 2 | | 11 | |
| 08:45 | | | 10 | 53 | 15 | 81 | 25 | 134 | 20:45 | | | 15 | 54 | 2 | 12 | 17 | 66 |
| 09:00 | | | 4 | | 18 | | 22 | | 21:00 | | | 8 | | 5 | | 13 | |
| 09:15 | | | 4 | | 9 | | 13 | | 21:15 | | | 6 | | 3 | | 9 | |
| 09:30 | | | 5 | | 9 | | 14 | | 21:30 | | | 7 | | 3 | | 10 | |
| 09:45 | | | 10 | 23 | 14 | 50 | 24 | 73 | 21:45 | | | 7 | 28 | 2 | 13 | 9 | 41 |
| 10:00 | | | 6 | | 11 | | 17 | | 22:00 | | | 4 | | 1 | | 5 | |
| 10:15 | | | 5 | | 10 | | 15 | | 22:15 | | | 3 | | 2 | | 5 | |
| 10:30 | | | 8 | | 11 | | 19 | | 22:30 | | | 2 | | 1 | | 3 | |
| 10:45 | | | 6 | 25 | 6 | 38 | 12 | 63 | 22:45 | | | 2 | 11 | 1 | 5 | 3 | 16 |
| 11:00 | | | 7 | | 10 | | 17 | | 23:00 | | | 1 | | 2 | | 3 | |
| 11:15 | | | 7 | | 7 | | 14 | | 23:15 | | | 5 | | 3 | | 8 | |
| 11:30 | | | 16 | | 13 | | 29 | | 23:30 | | | 1 | | 1 | | 2 | |
| 11:45 | | | 16 | 46 | 9 | 39 | 25 | 85 | 23:45 | | | 2 | 9 | 1 | 7 | 3 | 16 |
| TOTALS | | | | 186 | | 324 | | 510 | TOTALS | | | | 507 | | 370 | | 877 |
| SPLIT % | | | | 36.5% | | 63.5% | | 36.8% | SPLIT % | | | | 57.8% | | 42.2% | | 63.2% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 693 | 694 | 1,387 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:30 | 07:30 | 07:30 | PM Peak Hour | | | 15:00 | 17:00 | 15:00 |
| AM Pk Volume | | | 55 | 109 | 164 | PM Pk Volume | | | 73 | 56 | 115 |
| Pk Hr Factor | | | 0.655 | 0.801 | 0.911 | Pk Hr Factor | | | 0.730 | 0.778 | 0.846 |
| 7 - 9 Volume | 0 | 0 | 80 | 156 | 236 | 4 - 6 Volume | 0 | 0 | 103 | 104 | 207 |
| 7 - 9 Peak Hour | | | 07:30 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:00 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 55 | 109 | 164 | 4 - 6 Pk Volume | 0 | 0 | 52 | 56 | 107 |
| Pk Hr Factor | 0.000 | 0.000 | 0.655 | 0.801 | 0.911 | Pk Hr Factor | 0.000 | 0.000 | 0.813 | 0.778 | 0.811 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way W/O Summit Creek Ln

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_006

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 785 | 795 | 1,580 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 3 | | 1 | | 4 | | 12:00 | | | 6 | | 17 | | 23 | |
| 00:15 | | | 1 | | 0 | | 1 | | 12:15 | | | 17 | | 5 | | 22 | |
| 00:30 | | | 0 | | 1 | | 1 | | 12:30 | | | 8 | | 16 | | 24 | |
| 00:45 | | | 1 | 5 | 1 | 3 | 2 | 8 | 12:45 | | | 3 | 34 | 11 | 49 | 14 | 83 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 11 | | 6 | | 17 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 16 | | 3 | | 19 | |
| 01:30 | | | 1 | | 1 | | 2 | | 13:30 | | | 11 | | 11 | | 22 | |
| 01:45 | | | 1 | 3 | 1 | 2 | 2 | 5 | 13:45 | | | 8 | 46 | 12 | 32 | 20 | 78 |
| 02:00 | | | 1 | | 1 | | 2 | | 14:00 | | | 13 | | 12 | | 25 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 9 | | 10 | | 19 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 7 | | 22 | | 29 | |
| 02:45 | | | 3 | 4 | 2 | 3 | 5 | 7 | 14:45 | | | 17 | 46 | 16 | 60 | 33 | 106 |
| 03:00 | | | 0 | | 1 | | 1 | | 15:00 | | | 22 | | 11 | | 33 | |
| 03:15 | | | 0 | | 1 | | 1 | | 15:15 | | | 32 | | 8 | | 40 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 20 | | 13 | | 33 | |
| 03:45 | | | 0 | | 0 | 2 | 0 | 2 | 15:45 | | | 12 | 86 | 19 | 51 | 31 | 137 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 17 | | 10 | | 27 | |
| 04:15 | | | 0 | | 1 | | 1 | | 16:15 | | | 11 | | 15 | | 26 | |
| 04:30 | | | 1 | | 1 | | 2 | | 16:30 | | | 13 | | 14 | | 27 | |
| 04:45 | | | 0 | 1 | 3 | 5 | 3 | 6 | 16:45 | | | 14 | 55 | 13 | 52 | 27 | 107 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 21 | | 18 | | 39 | |
| 05:15 | | | 0 | | 2 | | 2 | | 17:15 | | | 18 | | 9 | | 27 | |
| 05:30 | | | 0 | | 1 | | 1 | | 17:30 | | | 21 | | 14 | | 35 | |
| 05:45 | | | 0 | 1 | 3 | 6 | 3 | 7 | 17:45 | | | 19 | 79 | 14 | 55 | 33 | 134 |
| 06:00 | | | 0 | | 2 | | 2 | | 18:00 | | | 21 | | 13 | | 34 | |
| 06:15 | | | 0 | | 8 | | 8 | | 18:15 | | | 17 | | 18 | | 35 | |
| 06:30 | | | 3 | | 6 | | 9 | | 18:30 | | | 10 | | 5 | | 15 | |
| 06:45 | | | 2 | 5 | 5 | 21 | 7 | 26 | 18:45 | | | 12 | 60 | 16 | 52 | 28 | 112 |
| 07:00 | | | 1 | | 3 | | 4 | | 19:00 | | | 16 | | 13 | | 29 | |
| 07:15 | | | 4 | | 14 | | 18 | | 19:15 | | | 21 | | 12 | | 33 | |
| 07:30 | | | 7 | | 43 | | 50 | | 19:30 | | | 15 | | 8 | | 23 | |
| 07:45 | | | 19 | 31 | 25 | 85 | 44 | 116 | 19:45 | | | 8 | 60 | 7 | 40 | 15 | 100 |
| 08:00 | | | 16 | | 34 | | 50 | | 20:00 | | | 13 | | 7 | | 20 | |
| 08:15 | | | 17 | | 14 | | 31 | | 20:15 | | | 11 | | 11 | | 22 | |
| 08:30 | | | 10 | | 8 | | 18 | | 20:30 | | | 5 | | 5 | | 10 | |
| 08:45 | | | 10 | 53 | 15 | 71 | 25 | 124 | 20:45 | | | 17 | 46 | 4 | 27 | 21 | 73 |
| 09:00 | | | 10 | | 13 | | 23 | | 21:00 | | | 11 | | 5 | | 16 | |
| 09:15 | | | 10 | | 15 | | 25 | | 21:15 | | | 8 | | 3 | | 11 | |
| 09:30 | | | 3 | | 8 | | 11 | | 21:30 | | | 8 | | 4 | | 12 | |
| 09:45 | | | 5 | 28 | 21 | 57 | 26 | 85 | 21:45 | | | 5 | 32 | 4 | 16 | 9 | 48 |
| 10:00 | | | 10 | | 10 | | 20 | | 22:00 | | | 10 | | 4 | | 14 | |
| 10:15 | | | 3 | | 14 | | 17 | | 22:15 | | | 7 | | 3 | | 10 | |
| 10:30 | | | 10 | | 15 | | 25 | | 22:30 | | | 7 | | 2 | | 9 | |
| 10:45 | | | 11 | 34 | 8 | 47 | 19 | 81 | 22:45 | | | 7 | 31 | 2 | 11 | 9 | 42 |
| 11:00 | | | 12 | | 8 | | 20 | | 23:00 | | | 3 | | 2 | | 5 | |
| 11:15 | | | 8 | | 8 | | 16 | | 23:15 | | | 2 | | 1 | | 3 | |
| 11:30 | | | 11 | | 16 | | 27 | | 23:30 | | | 1 | | 1 | | 2 | |
| 11:45 | | | 5 | 36 | 10 | 42 | 15 | 78 | 23:45 | | | 3 | 9 | 2 | 6 | 5 | 15 |
| TOTALS | | | | 201 | | 344 | | 545 | TOTALS | | | | 584 | | 451 | | 1035 |
| SPLIT % | | | | 36.9% | | 63.1% | | 34.5% | SPLIT % | | | | 56.4% | | 43.6% | | 65.5% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 785 | 795 | 1,580 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:45 | 07:15 | 07:30 | PM Peak Hour | | | 14:45 | 14:00 | 14:45 |
| AM Pk Volume | | | 62 | 116 | 175 | PM Pk Volume | | | 91 | 60 | 139 |
| Pk Hr Factor | | | 0.816 | 0.674 | 0.875 | Pk Hr Factor | | | 0.711 | 0.682 | 0.869 |
| 7 - 9 Volume | 0 | 0 | 84 | 156 | 240 | 4 - 6 Volume | 0 | 0 | 134 | 107 | 241 |
| 7 - 9 Peak Hour | | | 07:45 | 07:15 | 07:30 | 4 - 6 Peak Hour | | | 17:00 | 16:15 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 62 | 116 | 175 | 4 - 6 Pk Volume | 0 | 0 | 79 | 60 | 134 |
| Pk Hr Factor | 0.000 | 0.000 | 0.816 | 0.674 | 0.875 | Pk Hr Factor | 0.000 | 0.000 | 0.940 | 0.833 | 0.859 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way W/O Summit Creek Ln

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_006

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 667 | 663 | 1,330 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 2 | | 1 | | 3 | | 12:00 | | | 15 | | 11 | | 26 | |
| 00:15 | | | 1 | | 3 | | 4 | | 12:15 | | | 17 | | 12 | | 29 | |
| 00:30 | | | 3 | | 1 | | 4 | | 12:30 | | | 8 | | 9 | | 17 | |
| 00:45 | | | 3 | 9 | 1 | 6 | 4 | 15 | 12:45 | | | 14 | 54 | 13 | 45 | 27 | 99 |
| 01:00 | | | 1 | | 1 | | 2 | | 13:00 | | | 8 | | 13 | | 21 | |
| 01:15 | | | 1 | | 1 | | 2 | | 13:15 | | | 13 | | 12 | | 25 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 11 | | 13 | | 24 | |
| 01:45 | | | 2 | 4 | 1 | 3 | 3 | 7 | 13:45 | | | 15 | 47 | 10 | 48 | 25 | 95 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 12 | | 9 | | 21 | |
| 02:15 | | | 2 | | 1 | | 3 | | 14:15 | | | 13 | | 15 | | 28 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 9 | | 3 | | 12 | |
| 02:45 | | | 0 | 4 | 0 | 1 | 0 | 5 | 14:45 | | | 28 | 62 | 10 | 37 | 38 | 99 |
| 03:00 | | | 1 | | 1 | | 2 | | 15:00 | | | 15 | | 9 | | 24 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 12 | | 13 | | 25 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 13 | | 17 | | 30 | |
| 03:45 | | | 0 | 1 | 0 | 1 | 0 | 2 | 15:45 | | | 9 | 49 | 20 | 59 | 29 | 108 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 15 | | 6 | | 21 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 8 | | 10 | | 18 | |
| 04:30 | | | 0 | | 0 | | 0 | | 16:30 | | | 12 | | 9 | | 21 | |
| 04:45 | | | 0 | | 0 | | 0 | | 16:45 | | | 17 | 52 | 11 | 36 | 28 | 88 |
| 05:00 | | | 0 | | 0 | | 0 | | 17:00 | | | 14 | | 8 | | 22 | |
| 05:15 | | | 0 | | 1 | | 1 | | 17:15 | | | 10 | | 9 | | 19 | |
| 05:30 | | | 1 | | 1 | | 2 | | 17:30 | | | 14 | | 15 | | 29 | |
| 05:45 | | | 0 | 1 | 0 | 2 | 0 | 3 | 17:45 | | | 16 | 54 | 10 | 42 | 26 | 96 |
| 06:00 | | | 0 | | 2 | | 2 | | 18:00 | | | 15 | | 15 | | 30 | |
| 06:15 | | | 0 | | 3 | | 3 | | 18:15 | | | 15 | | 8 | | 23 | |
| 06:30 | | | 0 | | 3 | | 3 | | 18:30 | | | 9 | | 12 | | 21 | |
| 06:45 | | | 0 | | 1 | 9 | 1 | 9 | 18:45 | | | 13 | 52 | 7 | 42 | 20 | 94 |
| 07:00 | | | 2 | | 3 | | 5 | | 19:00 | | | 8 | | 11 | | 19 | |
| 07:15 | | | 2 | | 2 | | 4 | | 19:15 | | | 11 | | 7 | | 18 | |
| 07:30 | | | 2 | | 6 | | 8 | | 19:30 | | | 13 | | 9 | | 22 | |
| 07:45 | | | 3 | 9 | 11 | 22 | 14 | 31 | 19:45 | | | 7 | 39 | 8 | 35 | 15 | 74 |
| 08:00 | | | 4 | | 6 | | 10 | | 20:00 | | | 3 | | 2 | | 5 | |
| 08:15 | | | 7 | | 7 | | 14 | | 20:15 | | | 11 | | 5 | | 16 | |
| 08:30 | | | 1 | | 13 | | 14 | | 20:30 | | | 8 | | 5 | | 13 | |
| 08:45 | | | 5 | 17 | 10 | 36 | 15 | 53 | 20:45 | | | 6 | 28 | 10 | 22 | 16 | 50 |
| 09:00 | | | 4 | | 8 | | 12 | | 21:00 | | | 7 | | 4 | | 11 | |
| 09:15 | | | 11 | | 22 | | 33 | | 21:15 | | | 7 | | 2 | | 9 | |
| 09:30 | | | 6 | | 18 | | 24 | | 21:30 | | | 4 | | 4 | | 8 | |
| 09:45 | | | 4 | 25 | 13 | 61 | 17 | 86 | 21:45 | | | 9 | 27 | 3 | 13 | 12 | 40 |
| 10:00 | | | 10 | | 14 | | 24 | | 22:00 | | | 5 | | 5 | | 10 | |
| 10:15 | | | 10 | | 10 | | 20 | | 22:15 | | | 12 | | 4 | | 16 | |
| 10:30 | | | 17 | | 17 | | 34 | | 22:30 | | | 6 | | 3 | | 9 | |
| 10:45 | | | 6 | 43 | 17 | 58 | 23 | 101 | 22:45 | | | 14 | 37 | 6 | 18 | 20 | 55 |
| 11:00 | | | 9 | | 12 | | 21 | | 23:00 | | | 6 | | 2 | | 8 | |
| 11:15 | | | 7 | | 13 | | 20 | | 23:15 | | | 5 | | 2 | | 7 | |
| 11:30 | | | 11 | | 15 | | 26 | | 23:30 | | | 1 | | 2 | | 3 | |
| 11:45 | | | 10 | 37 | 14 | 54 | 24 | 91 | 23:45 | | | 4 | 16 | 7 | 13 | 11 | 29 |
| TOTALS | | | | 150 | | 253 | | 403 | TOTALS | | | | 517 | | 410 | | 927 |
| SPLIT % | | | | 37.2% | | 62.8% | | 30.3% | SPLIT % | | | | 55.8% | | 44.2% | | 69.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 667 | 663 | 1,330 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:30 | 09:15 | 11:30 | PM Peak Hour | | | 14:45 | 15:00 | 14:45 |
| AM Pk Volume | | | 53 | 67 | 105 | PM Pk Volume | | | 68 | 59 | 117 |
| Pk Hr Factor | | | 0.779 | 0.761 | 0.905 | Pk Hr Factor | | | 0.607 | 0.738 | 0.770 |
| 7 - 9 Volume | 0 | 0 | 26 | 58 | 84 | 4 - 6 Volume | 0 | 0 | 106 | 78 | 184 |
| 7 - 9 Peak Hour | | | 08:00 | 07:45 | 08:00 | 4 - 6 Peak Hour | | | 16:45 | 16:45 | 16:45 |
| 7 - 9 Pk Volume | 0 | 0 | 17 | 37 | 53 | 4 - 6 Pk Volume | 0 | 0 | 55 | 43 | 98 |
| Pk Hr Factor | 0.000 | 0.000 | 0.607 | 0.712 | 0.883 | Pk Hr Factor | 0.000 | 0.000 | 0.809 | 0.717 | 0.845 |

Prepared by NDS/ATD

# VOLUME

Alisal St S/O Sycamore Rd

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_007

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 521 | 413 | 0 | 0 | 934 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 1 | | | | | | 1 | | 12:00 | 9 | | 8 | | | | | | 17 | |
| 00:15 | 0 | | 1 | | | | | | 1 | | 12:15 | 8 | | 13 | | | | | | 21 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 8 | | 7 | | | | | | 15 | |
| 00:45 | 0 | | 1 | 3 | | | | | 1 | 3 | 12:45 | 7 | 32 | 5 | 33 | | | | | 12 | 65 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 9 | | 13 | | | | | | 22 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 7 | | 10 | | | | | | 17 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 12 | | 9 | | | | | | 21 | |
| 01:45 | 0 | | 0 | | | | | | 0 | | 13:45 | 5 | 33 | 6 | 38 | | | | | 11 | 71 |
| 02:00 | 0 | | 1 | | | | | | 1 | | 14:00 | 9 | | 8 | | | | | | 17 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 8 | | 8 | | | | | | 16 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 12 | | 7 | | | | | | 19 | |
| 02:45 | 0 | | 0 | 1 | | | | | 0 | 1 | 14:45 | 20 | 49 | 10 | 33 | | | | | 30 | 82 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 19 | | 5 | | | | | | 24 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 27 | | 8 | | | | | | 35 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 9 | | 6 | | | | | | 15 | |
| 03:45 | 0 | | 0 | | | | | | 0 | | 15:45 | 9 | 64 | 3 | 22 | | | | | 12 | 86 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 14 | | 7 | | | | | | 21 | |
| 04:15 | 1 | | 1 | | | | | | 2 | | 16:15 | 11 | | 6 | | | | | | 17 | |
| 04:30 | 1 | | 0 | | | | | | 1 | | 16:30 | 22 | | 4 | | | | | | 26 | |
| 04:45 | 0 | 2 | 3 | 4 | | | | | 3 | 6 | 16:45 | 5 | 52 | 10 | 27 | | | | | 15 | 79 |
| 05:00 | 1 | | 0 | | | | | | 1 | | 17:00 | 5 | | 9 | | | | | | 14 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 9 | | 8 | | | | | | 17 | |
| 05:30 | 0 | | 1 | | | | | | 1 | | 17:30 | 4 | | 4 | | | | | | 8 | |
| 05:45 | 2 | 3 | 1 | 2 | | | | | 3 | 5 | 17:45 | 23 | 41 | 7 | 28 | | | | | 30 | 69 |
| 06:00 | 1 | | 0 | | | | | | 1 | | 18:00 | 5 | | 3 | | | | | | 8 | |
| 06:15 | 1 | | 1 | | | | | | 2 | | 18:15 | 11 | | 4 | | | | | | 15 | |
| 06:30 | 1 | | 3 | | | | | | 4 | | 18:30 | 12 | | 5 | | | | | | 17 | |
| 06:45 | 3 | 6 | 5 | 9 | | | | | 8 | 15 | 18:45 | 7 | 35 | 8 | 20 | | | | | 15 | 55 |
| 07:00 | 8 | | 6 | | | | | | 14 | | 19:00 | 8 | | 6 | | | | | | 14 | |
| 07:15 | 6 | | 7 | | | | | | 13 | | 19:15 | 10 | | 6 | | | | | | 16 | |
| 07:30 | 7 | | 9 | | | | | | 16 | | 19:30 | 5 | | 8 | | | | | | 13 | |
| 07:45 | 12 | 33 | 8 | 30 | | | | | 20 | 63 | 19:45 | 9 | 32 | 3 | 23 | | | | | 12 | 55 |
| 08:00 | 10 | | 8 | | | | | | 18 | | 20:00 | 4 | | 2 | | | | | | 6 | |
| 08:15 | 9 | | 13 | | | | | | 22 | | 20:15 | 1 | | 2 | | | | | | 3 | |
| 08:30 | 6 | | 14 | | | | | | 20 | | 20:30 | 3 | | 2 | | | | | | 5 | |
| 08:45 | 16 | 41 | 8 | 43 | | | | | 24 | 84 | 20:45 | 1 | 9 | 3 | 9 | | | | | 4 | 18 |
| 09:00 | 7 | | 7 | | | | | | 14 | | 21:00 | 2 | | 3 | | | | | | 5 | |
| 09:15 | 4 | | 6 | | | | | | 10 | | 21:15 | 4 | | 1 | | | | | | 5 | |
| 09:30 | 3 | | 5 | | | | | | 8 | | 21:30 | 1 | | 2 | | | | | | 3 | |
| 09:45 | 5 | 19 | 12 | 30 | | | | | 17 | 49 | 21:45 | 1 | 8 | 2 | 8 | | | | | 3 | 16 |
| 10:00 | 5 | | 2 | | | | | | 7 | | 22:00 | 3 | | 1 | | | | | | 4 | |
| 10:15 | 10 | | 4 | | | | | | 14 | | 22:15 | 1 | | 1 | | | | | | 2 | |
| 10:30 | 2 | | 6 | | | | | | 8 | | 22:30 | 1 | | 0 | | | | | | 1 | |
| 10:45 | 8 | 25 | 6 | 18 | | | | | 14 | 43 | 22:45 | 1 | 6 | 0 | 2 | | | | | 1 | 8 |
| 11:00 | 10 | | 7 | | | | | | 17 | | 23:00 | 0 | | 1 | | | | | | 1 | |
| 11:15 | 2 | | 3 | | | | | | 5 | | 23:15 | 1 | | 2 | | | | | | 3 | |
| 11:30 | 8 | | 8 | | | | | | 16 | | 23:30 | 0 | | 0 | | | | | | 0 | |
| 11:45 | 10 | 30 | 8 | 26 | | | | | 18 | 56 | 23:45 | 0 | 1 | 1 | 4 | | | | | 1 | 5 |
| TOTALS | | 159 | | 166 | | | | | | 325 | TOTALS | | 362 | | 247 | | | | | | 609 |
| SPLIT % | | 48.9% | | 51.1% | | | | | | 34.8% | SPLIT % | | 59.4% | | 40.6% | | | | | | 65.2% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 521 | 413 | 0 | 0 | 934 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 08:00 | 07:45 | | | 08:00 | PM Peak Hour | 14:30 | 12:15 | | | 14:30 |
| AM Pk Volume | 41 | 43 | | | 84 | PM Pk Volume | 78 | 38 | | | 108 |
| Pk Hr Factor | 0.641 | 0.768 | | | 0.875 | Pk Hr Factor | 0.722 | 0.731 | | | 0.771 |
| 7 - 9 Volume | 74 | 73 | 0 | 0 | 147 | 4 - 6 Volume | 93 | 55 | 0 | 0 | 148 |
| 7 - 9 Peak Hour | 08:00 | 07:45 | | | 08:00 | 4 - 6 Peak Hour | 16:00 | 16:30 | | | 16:00 |
| 7 - 9 Pk Volume | 41 | 43 | 0 | 0 | 84 | 4 - 6 Pk Volume | 52 | 31 | 0 | 0 | 79 |
| Pk Hr Factor | 0.641 | 0.768 | 0.000 | 0.000 | 0.875 | Pk Hr Factor | 0.591 | 0.775 | 0.000 | 0.000 | 0.760 |

Prepared by NDS/ATD

# VOLUME

Alisal St S/O Sycamore Rd

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_007

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 612 | 484 | 0 | 0 | 1,096 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 1 | | 0 | | | | | | 1 | | 12:00 | 12 | | 9 | | | | | | 21 | |
| 00:15 | 1 | | 0 | | | | | | 1 | | 12:15 | 14 | | 7 | | | | | | 21 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 10 | | 10 | | | | | | 20 | |
| 00:45 | 0 | 2 | 4 | 4 | | | | | 4 | 6 | 12:45 | 7 | 43 | 17 | 43 | | | | | 24 | 86 |
| 01:00 | 1 | | 0 | | | | | | 1 | | 13:00 | 18 | | 13 | | | | | | 31 | |
| 01:15 | 0 | | 1 | | | | | | 1 | | 13:15 | 10 | | 11 | | | | | | 21 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 16 | | 9 | | | | | | 25 | |
| 01:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 13:45 | 9 | 53 | 8 | 41 | | | | | 17 | 94 |
| 02:00 | 0 | | 1 | | | | | | 1 | | 14:00 | 7 | | 5 | | | | | | 12 | |
| 02:15 | 1 | | 0 | | | | | | 1 | | 14:15 | 11 | | 5 | | | | | | 16 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 9 | | 7 | | | | | | 16 | |
| 02:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 14:45 | 12 | 39 | 6 | 23 | | | | | 18 | 62 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 10 | | 8 | | | | | | 18 | |
| 03:15 | 1 | | 0 | | | | | | 1 | | 15:15 | 8 | | 11 | | | | | | 19 | |
| 03:30 | 0 | | 1 | | | | | | 1 | | 15:30 | 12 | | 7 | | | | | | 19 | |
| 03:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 15:45 | 14 | 44 | 10 | 36 | | | | | 24 | 80 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 11 | | 4 | | | | | | 15 | |
| 04:15 | 0 | | 1 | | | | | | 1 | | 16:15 | 16 | | 6 | | | | | | 22 | |
| 04:30 | 1 | | 0 | | | | | | 1 | | 16:30 | 13 | | 5 | | | | | | 18 | |
| 04:45 | 0 | 1 | 3 | 4 | | | | | 3 | 5 | 16:45 | 5 | 45 | 10 | 25 | | | | | 15 | 70 |
| 05:00 | 1 | | 0 | | | | | | 1 | | 17:00 | 10 | | 12 | | | | | | 22 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 10 | | 14 | | | | | | 24 | |
| 05:30 | 0 | | 0 | | | | | | 0 | | 17:30 | 16 | | 7 | | | | | | 23 | |
| 05:45 | 1 | 2 | 0 | | | | | | 1 | 2 | 17:45 | 12 | 48 | 4 | 37 | | | | | 16 | 85 |
| 06:00 | 1 | | 1 | | | | | | 2 | | 18:00 | 8 | | 6 | | | | | | 14 | |
| 06:15 | 2 | | 1 | | | | | | 3 | | 18:15 | 19 | | 4 | | | | | | 23 | |
| 06:30 | 5 | | 4 | | | | | | 9 | | 18:30 | 9 | | 6 | | | | | | 15 | |
| 06:45 | 5 | 13 | 4 | 10 | | | | | 9 | 23 | 18:45 | 14 | 50 | 8 | 24 | | | | | 22 | 74 |
| 07:00 | 5 | | 12 | | | | | | 17 | | 19:00 | 13 | | 9 | | | | | | 22 | |
| 07:15 | 3 | | 10 | | | | | | 13 | | 19:15 | 10 | | 4 | | | | | | 14 | |
| 07:30 | 8 | | 4 | | | | | | 12 | | 19:30 | 18 | | 2 | | | | | | 20 | |
| 07:45 | 11 | 27 | 8 | 34 | | | | | 19 | 61 | 19:45 | 13 | 54 | 4 | 19 | | | | | 17 | 73 |
| 08:00 | 9 | | 8 | | | | | | 17 | | 20:00 | 9 | | 3 | | | | | | 12 | |
| 08:15 | 10 | | 6 | | | | | | 16 | | 20:15 | 8 | | 4 | | | | | | 12 | |
| 08:30 | 7 | | 14 | | | | | | 21 | | 20:30 | 5 | | 2 | | | | | | 7 | |
| 08:45 | 8 | 34 | 9 | 37 | | | | | 17 | 71 | 20:45 | 4 | 26 | 5 | 14 | | | | | 9 | 40 |
| 09:00 | 14 | | 13 | | | | | | 27 | | 21:00 | 2 | | 2 | | | | | | 4 | |
| 09:15 | 5 | | 8 | | | | | | 13 | | 21:15 | 3 | | 4 | | | | | | 7 | |
| 09:30 | 1 | | 9 | | | | | | 10 | | 21:30 | 6 | | 2 | | | | | | 8 | |
| 09:45 | 8 | 28 | 7 | 37 | | | | | 15 | 65 | 21:45 | 6 | 17 | 2 | 10 | | | | | 8 | 27 |
| 10:00 | 6 | | 11 | | | | | | 17 | | 22:00 | 2 | | 5 | | | | | | 7 | |
| 10:15 | 5 | | 5 | | | | | | 10 | | 22:15 | 4 | | 2 | | | | | | 6 | |
| 10:30 | 10 | | 10 | | | | | | 20 | | 22:30 | 2 | | 1 | | | | | | 3 | |
| 10:45 | 7 | 28 | 12 | 38 | | | | | 19 | 66 | 22:45 | 1 | 9 | 0 | 8 | | | | | 1 | 17 |
| 11:00 | 7 | | 15 | | | | | | 22 | | 23:00 | 1 | | 0 | | | | | | 1 | |
| 11:15 | 15 | | 8 | | | | | | 23 | | 23:15 | 0 | | 1 | | | | | | 1 | |
| 11:30 | 9 | | 6 | | | | | | 15 | | 23:30 | 1 | | 1 | | | | | | 2 | |
| 11:45 | 13 | 44 | 5 | 34 | | | | | 18 | 78 | 23:45 | 0 | 2 | 1 | 3 | | | | | 1 | 5 |
| TOTALS | | 182 | | 201 | | | | | | 383 | TOTALS | | 430 | | 283 | | | | | | 713 |
| SPLIT % | | 47.5% | | 52.5% | | | | | | 34.9% | SPLIT % | | 60.3% | | 39.7% | | | | | | 65.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 612 | 484 | 0 | 0 | 1,096 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:15 | 10:30 | | | 10:30 | PM Peak Hour | 17:30 | 12:30 | | | 12:45 |
| AM Pk Volume | 49 | 45 | | | 84 | PM Pk Volume | 55 | 51 | | | 101 |
| Pk Hr Factor | 0.817 | 0.750 | | | 0.913 | Pk Hr Factor | 0.724 | 0.750 | | | 0.815 |
| 7 - 9 Volume | 61 | 71 | 0 | 0 | 132 | 4 - 6 Volume | 93 | 62 | 0 | 0 | 155 |
| 7 - 9 Peak Hour | 07:30 | 08:00 | | | 07:45 | 4 - 6 Peak Hour | 17:00 | 16:45 | | | 17:00 |
| 7 - 9 Pk Volume | 38 | 37 | 0 | 0 | 73 | 4 - 6 Pk Volume | 48 | 43 | 0 | 0 | 85 |
| Pk Hr Factor | 0.864 | 0.661 | 0.000 | 0.000 | 0.869 | Pk Hr Factor | 0.750 | 0.768 | 0.000 | 0.000 | 0.885 |

Prepared by NDS/ATD

# VOLUME

Alisal St S/O Sycamore Rd

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_007

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 503 | 379 | 0 | 0 | 882 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 1 | | 1 | | | | | | 2 | | 12:00 | 7 | | 10 | | | | | | 17 | |
| 00:15 | 0 | | 0 | | | | | | 0 | | 12:15 | 8 | | 9 | | | | | | 17 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 3 | | 4 | | | | | | 7 | |
| 00:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 12:45 | 7 | 25 | 6 | 29 | | | | | 13 | 54 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 9 | | 5 | | | | | | 14 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 5 | | 11 | | | | | | 16 | |
| 01:30 | 1 | | 0 | | | | | | 1 | | 13:30 | 4 | | 5 | | | | | | 9 | |
| 01:45 | 0 | 1 | 0 | | | | | | 0 | 1 | 13:45 | 8 | 26 | 6 | 27 | | | | | 14 | 53 |
| 02:00 | 0 | | 0 | | | | | | 0 | | 14:00 | 11 | | 3 | | | | | | 14 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 9 | | 6 | | | | | | 15 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 9 | | 7 | | | | | | 16 | |
| 02:45 | 0 | | 0 | | | | | | 0 | | 14:45 | 8 | 37 | 10 | 26 | | | | | 18 | 63 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 6 | | 11 | | | | | | 17 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 11 | | 12 | | | | | | 23 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 6 | | 9 | | | | | | 15 | |
| 03:45 | 1 | 1 | 0 | | | | | | 1 | 1 | 15:45 | 8 | 31 | 9 | 41 | | | | | 17 | 72 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 8 | | 9 | | | | | | 17 | |
| 04:15 | 0 | | 2 | | | | | | 2 | | 16:15 | 10 | | 14 | | | | | | 24 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 11 | | 5 | | | | | | 16 | |
| 04:45 | 1 | 1 | 1 | 3 | | | | | 2 | 4 | 16:45 | 19 | 48 | 7 | 35 | | | | | 26 | 83 |
| 05:00 | 0 | | 0 | | | | | | 0 | | 17:00 | 10 | | 5 | | | | | | 15 | |
| 05:15 | 1 | | 0 | | | | | | 1 | | 17:15 | 9 | | 3 | | | | | | 12 | |
| 05:30 | 1 | | 0 | | | | | | 1 | | 17:30 | 4 | | 3 | | | | | | 7 | |
| 05:45 | 0 | 2 | 1 | 1 | | | | | 1 | 3 | 17:45 | 10 | 33 | 8 | 19 | | | | | 18 | 52 |
| 06:00 | 0 | | 0 | | | | | | 0 | | 18:00 | 5 | | 4 | | | | | | 9 | |
| 06:15 | 0 | | 2 | | | | | | 2 | | 18:15 | 7 | | 4 | | | | | | 11 | |
| 06:30 | 4 | | 4 | | | | | | 8 | | 18:30 | 8 | | 7 | | | | | | 15 | |
| 06:45 | 0 | 4 | 2 | 8 | | | | | 2 | 12 | 18:45 | 19 | 39 | 6 | 21 | | | | | 25 | 60 |
| 07:00 | 1 | | 2 | | | | | | 3 | | 19:00 | 12 | | 6 | | | | | | 18 | |
| 07:15 | 1 | | 2 | | | | | | 3 | | 19:15 | 13 | | 3 | | | | | | 16 | |
| 07:30 | 3 | | 2 | | | | | | 5 | | 19:30 | 11 | | 3 | | | | | | 14 | |
| 07:45 | 5 | 10 | 3 | 9 | | | | | 8 | 19 | 19:45 | 7 | 43 | 5 | 17 | | | | | 12 | 60 |
| 08:00 | 2 | | 5 | | | | | | 7 | | 20:00 | 4 | | 3 | | | | | | 7 | |
| 08:15 | 5 | | 4 | | | | | | 9 | | 20:15 | 4 | | 3 | | | | | | 7 | |
| 08:30 | 7 | | 8 | | | | | | 15 | | 20:30 | 4 | | 5 | | | | | | 9 | |
| 08:45 | 8 | 22 | 3 | 20 | | | | | 11 | 42 | 20:45 | 4 | 16 | 2 | 13 | | | | | 6 | 29 |
| 09:00 | 3 | | 4 | | | | | | 7 | | 21:00 | 10 | | 2 | | | | | | 12 | |
| 09:15 | 4 | | 20 | | | | | | 24 | | 21:15 | 11 | | 3 | | | | | | 14 | |
| 09:30 | 8 | | 1 | | | | | | 9 | | 21:30 | 3 | | 9 | | | | | | 12 | |
| 09:45 | 22 | 37 | 3 | 28 | | | | | 25 | 65 | 21:45 | 7 | 31 | 4 | 18 | | | | | 11 | 49 |
| 10:00 | 5 | | 4 | | | | | | 9 | | 22:00 | 4 | | 3 | | | | | | 7 | |
| 10:15 | 8 | | 6 | | | | | | 14 | | 22:15 | 3 | | 3 | | | | | | 6 | |
| 10:30 | 6 | | 5 | | | | | | 11 | | 22:30 | 5 | | 1 | | | | | | 6 | |
| 10:45 | 9 | 28 | 2 | 17 | | | | | 11 | 45 | 22:45 | 6 | 18 | 5 | 12 | | | | | 11 | 30 |
| 11:00 | 8 | | 8 | | | | | | 16 | | 23:00 | 4 | | 2 | | | | | | 6 | |
| 11:15 | 12 | | 7 | | | | | | 19 | | 23:15 | 2 | | 5 | | | | | | 7 | |
| 11:30 | 9 | | 2 | | | | | | 11 | | 23:30 | 4 | | 2 | | | | | | 6 | |
| 11:45 | 8 | 37 | 6 | 23 | | | | | 14 | 60 | 23:45 | 2 | 12 | 2 | 11 | | | | | 4 | 23 |
| TOTALS | | 144 | | 110 | | | | | | 254 | TOTALS | | 359 | | 269 | | | | | | 628 |
| SPLIT % | | 56.7% | | 43.3% | | | | | | 28.8% | SPLIT % | | 57.2% | | 42.8% | | | | | | 71.2% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 503 | 379 | 0 | 0 | 882 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 09:30 | 08:30 | | | 09:15 | PM Peak Hour | 18:45 | 14:45 | | | 16:00 |
| AM Pk Volume | 43 | 35 | | | 67 | PM Pk Volume | 55 | 42 | | | 83 |
| Pk Hr Factor | 0.489 | 0.438 | | | 0.670 | Pk Hr Factor | 0.724 | 0.875 | | | 0.798 |
| 7 - 9 Volume | 32 | 29 | 0 | 0 | 61 | 4 - 6 Volume | 81 | 54 | 0 | 0 | 135 |
| 7 - 9 Peak Hour | 08:00 | 07:45 | | | 08:00 | 4 - 6 Peak Hour | 16:15 | 16:00 | | | 16:00 |
| 7 - 9 Pk Volume | 22 | 20 | 0 | 0 | 42 | 4 - 6 Pk Volume | 50 | 35 | 0 | 0 | 83 |
| Pk Hr Factor | 0.688 | 0.625 | 0.000 | 0.000 | 0.700 | Pk Hr Factor | 0.658 | 0.625 | 0.000 | 0.000 | 0.798 |

Prepared by NDS/ATD

# VOLUME

Alisal St N/O Happy Valley Rd

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_008

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 316 | 266 | 0 | 0 | 582 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 0 | | | | | | 0 | | 12:00 | 7 | | 1 | | | | | | 8 | |
| 00:15 | 0 | | 0 | | | | | | 0 | | 12:15 | 3 | | 8 | | | | | | 11 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 2 | | 8 | | | | | | 10 | |
| 00:45 | 0 | | 0 | | | | | | 0 | | 12:45 | 6 | 18 | 6 | 23 | | | | | 12 | 41 |
| 01:00 | 0 | | 0 | | | | | | 0 | | 13:00 | 2 | | 3 | | | | | | 5 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 6 | | 4 | | | | | | 10 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 9 | | 4 | | | | | | 13 | |
| 01:45 | 0 | | 0 | | | | | | 0 | | 13:45 | 2 | 19 | 4 | 15 | | | | | 6 | 34 |
| 02:00 | 0 | | 1 | | | | | | 1 | | 14:00 | 2 | | 4 | | | | | | 6 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 7 | | 10 | | | | | | 17 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 9 | | 3 | | | | | | 12 | |
| 02:45 | 0 | | 0 | 1 | | | | | 0 | 1 | 14:45 | 15 | 33 | 12 | 29 | | | | | 27 | 62 |
| 03:00 | 1 | | 0 | | | | | | 1 | | 15:00 | 17 | | 8 | | | | | | 25 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 19 | | 8 | | | | | | 27 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 5 | | 3 | | | | | | 8 | |
| 03:45 | 0 | 1 | 0 | | | | | | 0 | 1 | 15:45 | 6 | 47 | 3 | 22 | | | | | 9 | 69 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 9 | | 0 | | | | | | 9 | |
| 04:15 | 1 | | 1 | | | | | | 2 | | 16:15 | 8 | | 4 | | | | | | 12 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 12 | | 2 | | | | | | 14 | |
| 04:45 | 0 | 1 | 5 | 6 | | | | | 5 | 7 | 16:45 | 2 | 31 | 2 | 8 | | | | | 4 | 39 |
| 05:00 | 1 | | 0 | | | | | | 1 | | 17:00 | 2 | | 8 | | | | | | 10 | |
| 05:15 | 0 | | 1 | | | | | | 1 | | 17:15 | 6 | | 0 | | | | | | 6 | |
| 05:30 | 0 | | 1 | | | | | | 1 | | 17:30 | 8 | | 2 | | | | | | 10 | |
| 05:45 | 0 | 1 | 1 | 3 | | | | | 1 | 4 | 17:45 | 15 | 31 | 7 | 17 | | | | | 22 | 48 |
| 06:00 | 0 | | 0 | | | | | | 0 | | 18:00 | 4 | | 1 | | | | | | 5 | |
| 06:15 | 0 | | 1 | | | | | | 1 | | 18:15 | 8 | | 4 | | | | | | 12 | |
| 06:30 | 0 | | 4 | | | | | | 4 | | 18:30 | 10 | | 4 | | | | | | 14 | |
| 06:45 | 1 | 1 | 4 | 9 | | | | | 5 | 10 | 18:45 | 9 | 31 | 5 | 14 | | | | | 14 | 45 |
| 07:00 | 2 | | 4 | | | | | | 6 | | 19:00 | 8 | | 2 | | | | | | 10 | |
| 07:15 | 4 | | 8 | | | | | | 12 | | 19:15 | 7 | | 3 | | | | | | 10 | |
| 07:30 | 2 | | 4 | | | | | | 6 | | 19:30 | 5 | | 4 | | | | | | 9 | |
| 07:45 | 7 | 15 | 4 | 20 | | | | | 11 | 35 | 19:45 | 6 | 26 | 1 | 10 | | | | | 7 | 36 |
| 08:00 | 2 | | 5 | | | | | | 7 | | 20:00 | 3 | | 2 | | | | | | 5 | |
| 08:15 | 3 | | 7 | | | | | | 10 | | 20:15 | 0 | | 0 | | | | | | 0 | |
| 08:30 | 3 | | 11 | | | | | | 14 | | 20:30 | 2 | | 1 | | | | | | 3 | |
| 08:45 | 6 | 14 | 5 | 28 | | | | | 11 | 42 | 20:45 | 1 | 6 | 1 | 4 | | | | | 2 | 10 |
| 09:00 | 0 | | 6 | | | | | | 6 | | 21:00 | 0 | | 0 | | | | | | 0 | |
| 09:15 | 4 | | 5 | | | | | | 9 | | 21:15 | 3 | | 2 | | | | | | 5 | |
| 09:30 | 0 | | 6 | | | | | | 6 | | 21:30 | 2 | | 1 | | | | | | 3 | |
| 09:45 | 4 | 8 | 8 | 25 | | | | | 12 | 33 | 21:45 | 0 | 5 | 0 | 3 | | | | | 0 | 8 |
| 10:00 | 4 | | 2 | | | | | | 6 | | 22:00 | 2 | | 0 | | | | | | 2 | |
| 10:15 | 2 | | 3 | | | | | | 5 | | 22:15 | 0 | | 0 | | | | | | 0 | |
| 10:30 | 1 | | 4 | | | | | | 5 | | 22:30 | 1 | | 0 | | | | | | 1 | |
| 10:45 | 4 | 11 | 5 | 14 | | | | | 9 | 25 | 22:45 | 0 | 3 | 0 | | | | | | 0 | 3 |
| 11:00 | 5 | | 7 | | | | | | 12 | | 23:00 | 0 | | 0 | | | | | | 0 | |
| 11:15 | 0 | | 0 | | | | | | 0 | | 23:15 | 0 | | 0 | | | | | | 0 | |
| 11:30 | 5 | | 3 | | | | | | 8 | | 23:30 | 0 | | 0 | | | | | | 0 | |
| 11:45 | 4 | 14 | 5 | 15 | | | | | 9 | 29 | 23:45 | 0 | | 0 | | | | | | 0 | |
| TOTALS | | 66 | | 121 | | | | | | 187 | TOTALS | | 250 | | 145 | | | | | | 395 |
| SPLIT % | | 35.3% | | 64.7% | | | | | | 32.1% | SPLIT % | | 63.3% | | 36.7% | | | | | | 67.9% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 316 | 266 | 0 | 0 | 582 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:30 | 08:15 | | | 07:45 | PM Peak Hour | 14:30 | 14:15 | | | 14:30 |
| AM Pk Volume | 19 | 29 | | | 42 | PM Pk Volume | 60 | 33 | | | 91 |
| Pk Hr Factor | 0.679 | 0.659 | | | 0.750 | Pk Hr Factor | 0.789 | 0.688 | | | 0.843 |
| 7 - 9 Volume | 29 | 48 | 0 | 0 | 77 | 4 - 6 Volume | 62 | 25 | 0 | 0 | 87 |
| 7 - 9 Peak Hour | 07:00 | 08:00 | | | 07:45 | 4 - 6 Peak Hour | 16:00 | 17:00 | | | 17:00 |
| 7 - 9 Pk Volume | 15 | 28 | 0 | 0 | 42 | 4 - 6 Pk Volume | 31 | 17 | 0 | 0 | 48 |
| Pk Hr Factor | 0.536 | 0.636 | 0.000 | 0.000 | 0.750 | Pk Hr Factor | 0.646 | 0.531 | 0.000 | 0.000 | 0.545 |

Prepared by NDS/ATD

# VOLUME

Alisal St N/O Happy Valley Rd

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_008

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 345 | 274 | 0 | 0 | 619 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 1 | | 1 | | | | | | 2 | | 12:00 | 8 | | 4 | | | | | | 12 | |
| 00:15 | 0 | | 0 | | | | | | 0 | | 12:15 | 3 | | 7 | | | | | | 10 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 7 | | 4 | | | | | | 11 | |
| 00:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 12:45 | 4 | 22 | 5 | 20 | | | | | 9 | 42 |
| 01:00 | 1 | | 1 | | | | | | 2 | | 13:00 | 11 | | 3 | | | | | | 14 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 4 | | 2 | | | | | | 6 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 13 | | 11 | | | | | | 24 | |
| 01:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 13:45 | 6 | 34 | 5 | 21 | | | | | 11 | 55 |
| 02:00 | 0 | | 0 | | | | | | 0 | | 14:00 | 5 | | 4 | | | | | | 9 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 7 | | 3 | | | | | | 10 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 8 | | 4 | | | | | | 12 | |
| 02:45 | 0 | | 0 | | | | | | 0 | | 14:45 | 7 | 27 | 6 | 17 | | | | | 13 | 44 |
| 03:00 | 1 | | 0 | | | | | | 1 | | 15:00 | 11 | | 5 | | | | | | 16 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 6 | | 6 | | | | | | 12 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 9 | | 4 | | | | | | 13 | |
| 03:45 | 0 | 1 | 0 | | | | | | 0 | 1 | 15:45 | 7 | 33 | 5 | 20 | | | | | 12 | 53 |
| 04:00 | 0 | | 0 | | | | | | 0 | | 16:00 | 4 | | 12 | | | | | | 16 | |
| 04:15 | 0 | | 1 | | | | | | 1 | | 16:15 | 12 | | 6 | | | | | | 18 | |
| 04:30 | 1 | | 0 | | | | | | 1 | | 16:30 | 8 | | 3 | | | | | | 11 | |
| 04:45 | 0 | 1 | 3 | 4 | | | | | 3 | 5 | 16:45 | 2 | 26 | 6 | 27 | | | | | 8 | 53 |
| 05:00 | 1 | | 0 | | | | | | 1 | | 17:00 | 6 | | 2 | | | | | | 8 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 9 | | 7 | | | | | | 16 | |
| 05:30 | 0 | | 0 | | | | | | 0 | | 17:30 | 13 | | 8 | | | | | | 21 | |
| 05:45 | 0 | 1 | 1 | 1 | | | | | 1 | 2 | 17:45 | 7 | 35 | 2 | 19 | | | | | 9 | 54 |
| 06:00 | 0 | | 0 | | | | | | 0 | | 18:00 | 11 | | 4 | | | | | | 15 | |
| 06:15 | 2 | | 3 | | | | | | 5 | | 18:15 | 9 | | 7 | | | | | | 16 | |
| 06:30 | 4 | | 3 | | | | | | 7 | | 18:30 | 10 | | 3 | | | | | | 13 | |
| 06:45 | 3 | 9 | 4 | 10 | | | | | 7 | 19 | 18:45 | 9 | 39 | 1 | 15 | | | | | 10 | 54 |
| 07:00 | 3 | | 8 | | | | | | 11 | | 19:00 | 9 | | 3 | | | | | | 12 | |
| 07:15 | 3 | | 6 | | | | | | 9 | | 19:15 | 7 | | 2 | | | | | | 9 | |
| 07:30 | 0 | | 3 | | | | | | 3 | | 19:30 | 18 | | 3 | | | | | | 21 | |
| 07:45 | 7 | 13 | 3 | 20 | | | | | 10 | 33 | 19:45 | 3 | 37 | 1 | 9 | | | | | 4 | 46 |
| 08:00 | 3 | | 4 | | | | | | 7 | | 20:00 | 0 | | 1 | | | | | | 1 | |
| 08:15 | 5 | | 5 | | | | | | 10 | | 20:15 | 1 | | 1 | | | | | | 2 | |
| 08:30 | 2 | | 6 | | | | | | 8 | | 20:30 | 0 | | 0 | | | | | | 0 | |
| 08:45 | 4 | 14 | 8 | 23 | | | | | 12 | 37 | 20:45 | 3 | 4 | 1 | 3 | | | | | 4 | 7 |
| 09:00 | 8 | | 7 | | | | | | 15 | | 21:00 | 0 | | 0 | | | | | | 0 | |
| 09:15 | 1 | | 5 | | | | | | 6 | | 21:15 | 1 | | 0 | | | | | | 1 | |
| 09:30 | 0 | | 8 | | | | | | 8 | | 21:30 | 2 | | 1 | | | | | | 3 | |
| 09:45 | 5 | 14 | 5 | 25 | | | | | 10 | 39 | 21:45 | 0 | 3 | 0 | 1 | | | | | 0 | 4 |
| 10:00 | 2 | | 7 | | | | | | 9 | | 22:00 | 1 | | 2 | | | | | | 3 | |
| 10:15 | 1 | | 2 | | | | | | 3 | | 22:15 | 0 | | 0 | | | | | | 0 | |
| 10:30 | 5 | | 5 | | | | | | 10 | | 22:30 | 0 | | 1 | | | | | | 1 | |
| 10:45 | 3 | 11 | 3 | 17 | | | | | 6 | 28 | 22:45 | 0 | 1 | 0 | 3 | | | | | 0 | 4 |
| 11:00 | 1 | | 9 | | | | | | 10 | | 23:00 | 0 | | 0 | | | | | | 0 | |
| 11:15 | 8 | | 5 | | | | | | 13 | | 23:15 | 0 | | 0 | | | | | | 0 | |
| 11:30 | 4 | | 0 | | | | | | 4 | | 23:30 | 1 | | 0 | | | | | | 1 | |
| 11:45 | 4 | 17 | 2 | 16 | | | | | 6 | 33 | 23:45 | 0 | 1 | 1 | 1 | | | | | 1 | 2 |
| TOTALS | | 83 | | 118 | | | | | | 201 | TOTALS | | 262 | | 156 | | | | | | 418 |
| SPLIT % | | 41.3% | | 58.7% | | | | | | 32.5% | SPLIT % | | 62.7% | | 37.3% | | | | | | 67.5% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 345 | 274 | 0 | 0 | 619 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 11:15 | 08:45 | | | 08:15 | PM Peak Hour | 18:45 | 15:15 | | | 17:15 |
| AM Pk Volume | 24 | 28 | | | 45 | PM Pk Volume | 43 | 27 | | | 61 |
| Pk Hr Factor | 0.750 | 0.875 | | | 0.750 | Pk Hr Factor | 0.597 | 0.563 | | | 0.726 |
| 7 - 9 Volume | 27 | 43 | 0 | 0 | 70 | 4 - 6 Volume | 61 | 46 | 0 | 0 | 107 |
| 7 - 9 Peak Hour | 07:45 | 08:00 | | | 08:00 | 4 - 6 Peak Hour | 17:00 | 16:00 | | | 17:00 |
| 7 - 9 Pk Volume | 17 | 23 | 0 | 0 | 37 | 4 - 6 Pk Volume | 35 | 27 | 0 | 0 | 54 |
| Pk Hr Factor | 0.607 | 0.719 | 0.000 | 0.000 | 0.771 | Pk Hr Factor | 0.673 | 0.563 | 0.000 | 0.000 | 0.643 |

Prepared by NDS/ATD

# VOLUME

Alisal St N/O Happy Valley Rd

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_008

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 351 | 273 | 0 | 0 | 624 |

| AM Period | NB | | SB | | EB | | WB | | TOTAL | | PM Period | NB | | SB | | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | 0 | | 0 | | | | | | 0 | | 12:00 | 8 | | 6 | | | | | | 14 | |
| 00:15 | 1 | | 1 | | | | | | 2 | | 12:15 | 3 | | 7 | | | | | | 10 | |
| 00:30 | 0 | | 0 | | | | | | 0 | | 12:30 | 1 | | 1 | | | | | | 2 | |
| 00:45 | 0 | 1 | 0 | 1 | | | | | 0 | 2 | 12:45 | 3 | 15 | 1 | 15 | | | | | 4 | 30 |
| 01:00 | 1 | | 0 | | | | | | 1 | | 13:00 | 8 | | 5 | | | | | | 13 | |
| 01:15 | 0 | | 0 | | | | | | 0 | | 13:15 | 4 | | 10 | | | | | | 14 | |
| 01:30 | 0 | | 0 | | | | | | 0 | | 13:30 | 4 | | 3 | | | | | | 7 | |
| 01:45 | 0 | 1 | 0 | | | | | | 0 | 1 | 13:45 | 3 | 19 | 2 | 20 | | | | | 5 | 39 |
| 02:00 | 0 | | 0 | | | | | | 0 | | 14:00 | 9 | | 6 | | | | | | 15 | |
| 02:15 | 0 | | 0 | | | | | | 0 | | 14:15 | 7 | | 4 | | | | | | 11 | |
| 02:30 | 0 | | 0 | | | | | | 0 | | 14:30 | 9 | | 3 | | | | | | 12 | |
| 02:45 | 0 | | 0 | | | | | | 0 | | 14:45 | 5 | 30 | 7 | 20 | | | | | 12 | 50 |
| 03:00 | 0 | | 0 | | | | | | 0 | | 15:00 | 4 | | 8 | | | | | | 12 | |
| 03:15 | 0 | | 0 | | | | | | 0 | | 15:15 | 6 | | 7 | | | | | | 13 | |
| 03:30 | 0 | | 0 | | | | | | 0 | | 15:30 | 12 | | 3 | | | | | | 15 | |
| 03:45 | 1 | 1 | 1 | 1 | | | | | 2 | 2 | 15:45 | 3 | 25 | 11 | 29 | | | | | 14 | 54 |
| 04:00 | 1 | | 1 | | | | | | 2 | | 16:00 | 9 | | 16 | | | | | | 25 | |
| 04:15 | 0 | | 1 | | | | | | 1 | | 16:15 | 8 | | 14 | | | | | | 22 | |
| 04:30 | 0 | | 0 | | | | | | 0 | | 16:30 | 10 | | 9 | | | | | | 19 | |
| 04:45 | 0 | 1 | 1 | 3 | | | | | 1 | 4 | 16:45 | 18 | 45 | 8 | 47 | | | | | 26 | 92 |
| 05:00 | 0 | | 3 | | | | | | 3 | | 17:00 | 7 | | 3 | | | | | | 10 | |
| 05:15 | 0 | | 0 | | | | | | 0 | | 17:15 | 9 | | 2 | | | | | | 11 | |
| 05:30 | 1 | | 0 | | | | | | 1 | | 17:30 | 3 | | 1 | | | | | | 4 | |
| 05:45 | 0 | 1 | 2 | 5 | | | | | 2 | 6 | 17:45 | 5 | 24 | 3 | 9 | | | | | 8 | 33 |
| 06:00 | 0 | | 0 | | | | | | 0 | | 18:00 | 3 | | 3 | | | | | | 6 | |
| 06:15 | 0 | | 2 | | | | | | 2 | | 18:15 | 5 | | 3 | | | | | | 8 | |
| 06:30 | 0 | | 3 | | | | | | 3 | | 18:30 | 5 | | 5 | | | | | | 10 | |
| 06:45 | 2 | 2 | 3 | 8 | | | | | 5 | 10 | 18:45 | 18 | 31 | 1 | 12 | | | | | 19 | 43 |
| 07:00 | 0 | | 3 | | | | | | 3 | | 19:00 | 12 | | 6 | | | | | | 18 | |
| 07:15 | 1 | | 2 | | | | | | 3 | | 19:15 | 9 | | 4 | | | | | | 13 | |
| 07:30 | 0 | | 1 | | | | | | 1 | | 19:30 | 8 | | 0 | | | | | | 8 | |
| 07:45 | 2 | 3 | 2 | 8 | | | | | 4 | 11 | 19:45 | 4 | 33 | 4 | 14 | | | | | 8 | 47 |
| 08:00 | 0 | | 3 | | | | | | 3 | | 20:00 | 4 | | 3 | | | | | | 7 | |
| 08:15 | 1 | | 3 | | | | | | 4 | | 20:15 | 1 | | 0 | | | | | | 1 | |
| 08:30 | 4 | | 5 | | | | | | 9 | | 20:30 | 1 | | 0 | | | | | | 1 | |
| 08:45 | 3 | 8 | 3 | 14 | | | | | 6 | 22 | 20:45 | 3 | 9 | 0 | 3 | | | | | 3 | 12 |
| 09:00 | 1 | | 5 | | | | | | 6 | | 21:00 | 10 | | 0 | | | | | | 10 | |
| 09:15 | 8 | | 3 | | | | | | 11 | | 21:15 | 9 | | 2 | | | | | | 11 | |
| 09:30 | 3 | | 2 | | | | | | 5 | | 21:30 | 1 | | 0 | | | | | | 1 | |
| 09:45 | 4 | 16 | 3 | 13 | | | | | 7 | 29 | 21:45 | 6 | 26 | 2 | 4 | | | | | 8 | 30 |
| 10:00 | 5 | | 6 | | | | | | 11 | | 22:00 | 5 | | 1 | | | | | | 6 | |
| 10:15 | 4 | | 3 | | | | | | 7 | | 22:15 | 3 | | 3 | | | | | | 6 | |
| 10:30 | 7 | | 6 | | | | | | 13 | | 22:30 | 9 | | 1 | | | | | | 10 | |
| 10:45 | 4 | 20 | 3 | 18 | | | | | 7 | 38 | 22:45 | 1 | 18 | 0 | 5 | | | | | 1 | 23 |
| 11:00 | 5 | | 6 | | | | | | 11 | | 23:00 | 4 | | 3 | | | | | | 7 | |
| 11:15 | 1 | | 4 | | | | | | 5 | | 23:15 | 2 | | 1 | | | | | | 3 | |
| 11:30 | 4 | | 4 | | | | | | 8 | | 23:30 | 0 | | 1 | | | | | | 1 | |
| 11:45 | 5 | 15 | 4 | 18 | | | | | 9 | 33 | 23:45 | 1 | 7 | 1 | 6 | | | | | 2 | 13 |
| TOTALS | | 69 | | 89 | | | | | | 158 | TOTALS | | 282 | | 184 | | | | | | 466 |
| SPLIT % | | 43.7% | | 56.3% | | | | | | 25.3% | SPLIT % | | 60.5% | | 39.5% | | | | | | 74.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 351 | 273 | 0 | 0 | 624 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | 09:15 | 11:30 | | | 11:30 | PM Peak Hour | 18:45 | 15:45 | | | 16:00 |
| AM Pk Volume | 20 | 21 | | | 41 | PM Pk Volume | 47 | 50 | | | 92 |
| Pk Hr Factor | 0.625 | 0.750 | | | 0.732 | Pk Hr Factor | 0.653 | 0.781 | | | 0.885 |
| 7 - 9 Volume | 11 | 22 | 0 | 0 | 33 | 4 - 6 Volume | 69 | 56 | 0 | 0 | 125 |
| 7 - 9 Peak Hour | 08:00 | 08:00 | | | 08:00 | 4 - 6 Peak Hour | 16:00 | 16:00 | | | 16:00 |
| 7 - 9 Pk Volume | 8 | 14 | 0 | 0 | 22 | 4 - 6 Pk Volume | 45 | 47 | 0 | 0 | 92 |
| Pk Hr Factor | 0.500 | 0.700 | 0.000 | 0.000 | 0.611 | Pk Hr Factor | 0.625 | 0.734 | 0.000 | 0.000 | 0.885 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd W/O Alisal St

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_009

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 311 | 222 | 533 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 8 | | 4 | | 12 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 6 | | 7 | | 13 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 4 | | 4 | | 8 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 11 | 29 | 3 | 18 | 14 | 47 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 10 | | 3 | | 13 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 7 | | 2 | | 9 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 6 | | 6 | | 12 | |
| 01:45 | | | 0 | | 0 | | 0 | | 13:45 | | | 4 | 27 | 1 | 12 | 5 | 39 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 9 | | 4 | | 13 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 8 | | 5 | | 13 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 5 | | 3 | | 8 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 5 | 27 | 7 | 19 | 12 | 46 |
| 03:00 | | | 2 | | 0 | | 2 | | 15:00 | | | 7 | | 7 | | 14 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 6 | | 2 | | 8 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 2 | | 5 | | 7 | |
| 03:45 | | | 0 | 2 | 0 | 1 | 0 | 3 | 15:45 | | | 3 | 18 | 1 | 15 | 4 | 33 |
| 04:00 | | | 1 | | 1 | | 2 | | 16:00 | | | 9 | | 3 | | 12 | |
| 04:15 | | | 1 | | 1 | | 2 | | 16:15 | | | 5 | | 2 | | 7 | |
| 04:30 | | | 2 | | 0 | | 2 | | 16:30 | | | 5 | | 6 | | 11 | |
| 04:45 | | | 2 | 6 | 1 | 3 | 3 | 9 | 16:45 | | | 2 | 21 | 3 | 14 | 5 | 35 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 5 | | 2 | | 7 | |
| 05:15 | | | 0 | | 1 | | 1 | | 17:15 | | | 7 | | 4 | | 11 | |
| 05:30 | | | 0 | | 1 | | 1 | | 17:30 | | | 10 | | 2 | | 12 | |
| 05:45 | | | 1 | 2 | 0 | 2 | 1 | 4 | 17:45 | | | 6 | 28 | 5 | 13 | 11 | 41 |
| 06:00 | | | 2 | | 1 | | 3 | | 18:00 | | | 5 | | 5 | | 10 | |
| 06:15 | | | 0 | | 2 | | 2 | | 18:15 | | | 5 | | 5 | | 10 | |
| 06:30 | | | 4 | | 2 | | 6 | | 18:30 | | | 6 | | 7 | | 13 | |
| 06:45 | | | 4 | 10 | 0 | 5 | 4 | 15 | 18:45 | | | 2 | 18 | 3 | 20 | 5 | 38 |
| 07:00 | | | 9 | | 4 | | 13 | | 19:00 | | | 1 | | 4 | | 5 | |
| 07:15 | | | 7 | | 4 | | 11 | | 19:15 | | | 2 | | 3 | | 5 | |
| 07:30 | | | 2 | | 10 | | 12 | | 19:30 | | | 4 | | 4 | | 8 | |
| 07:45 | | | 6 | 24 | 5 | 23 | 11 | 47 | 19:45 | | | 3 | 10 | 4 | 15 | 7 | 25 |
| 08:00 | | | 3 | | 4 | | 7 | | 20:00 | | | 3 | | 2 | | 5 | |
| 08:15 | | | 1 | | 1 | | 2 | | 20:15 | | | 2 | | 2 | | 4 | |
| 08:30 | | | 10 | | 6 | | 16 | | 20:30 | | | 3 | | 1 | | 4 | |
| 08:45 | | | 4 | 18 | 3 | 14 | 7 | 32 | 20:45 | | | 1 | 9 | 0 | 5 | 1 | 14 |
| 09:00 | | | 2 | | 3 | | 5 | | 21:00 | | | 2 | | 0 | | 2 | |
| 09:15 | | | 6 | | 6 | | 12 | | 21:15 | | | 2 | | 1 | | 3 | |
| 09:30 | | | 6 | | 1 | | 7 | | 21:30 | | | 3 | | 0 | | 3 | |
| 09:45 | | | 6 | 20 | 1 | 11 | 7 | 31 | 21:45 | | | 2 | 9 | 0 | 1 | 2 | 10 |
| 10:00 | | | 3 | | 2 | | 5 | | 22:00 | | | 0 | | 1 | | 1 | |
| 10:15 | | | 2 | | 4 | | 6 | | 22:15 | | | 0 | | 0 | | 0 | |
| 10:30 | | | 4 | | 2 | | 6 | | 22:30 | | | 2 | | 0 | | 2 | |
| 10:45 | | | 8 | 17 | 4 | 12 | 12 | 29 | 22:45 | | | 0 | 2 | 0 | 1 | 0 | 3 |
| 11:00 | | | 2 | | 3 | | 5 | | 23:00 | | | 0 | | 0 | | 0 | |
| 11:15 | | | 2 | | 3 | | 5 | | 23:15 | | | 0 | | 0 | | 0 | |
| 11:30 | | | 4 | | 4 | | 8 | | 23:30 | | | 2 | | 0 | | 2 | |
| 11:45 | | | 4 | 12 | 7 | 17 | 11 | 29 | 23:45 | | | 0 | 2 | 1 | 1 | 1 | 3 |
| TOTALS | | | | 111 | | 88 | | 199 | TOTALS | | | | 200 | | 134 | | 334 |
| SPLIT % | | | | 55.8% | | 44.2% | | 37.3% | SPLIT % | | | | 59.9% | | 40.1% | | 62.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 311 | 222 | 533 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 06:30 | 07:00 | 07:00 | PM Peak Hour | | | 12:45 | 14:15 | 12:15 |
| AM Pk Volume | | | 24 | 23 | 47 | PM Pk Volume | | | 34 | 22 | 48 |
| Pk Hr Factor | | | 0.667 | 0.575 | 0.904 | Pk Hr Factor | | | 0.773 | 0.786 | 0.857 |
| 7 - 9 Volume | 0 | 0 | 42 | 37 | 79 | 4 - 6 Volume | 0 | 0 | 49 | 27 | 76 |
| 7 - 9 Peak Hour | | | 07:00 | 07:00 | 07:00 | 4 - 6 Peak Hour | | | 17:00 | 16:30 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 24 | 23 | 47 | 4 - 6 Pk Volume | 0 | 0 | 28 | 15 | 41 |
| Pk Hr Factor | 0.000 | 0.000 | 0.667 | 0.575 | 0.904 | Pk Hr Factor | 0.000 | 0.000 | 0.700 | 0.625 | 0.854 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd W/O Alisal St

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_009

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 333 | 211 | 544 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 0 | | 1 | | 12:00 | | | 5 | | 2 | | 7 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 13 | | 1 | | 14 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 3 | | 3 | | 6 | |
| 00:45 | | | 0 | 1 | 0 | | 0 | 1 | 12:45 | | | 6 | 27 | 2 | 8 | 8 | 35 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 10 | | 1 | | 11 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 7 | | 0 | | 7 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 7 | | 11 | | 18 | |
| 01:45 | | | 0 | | 0 | | 0 | | 13:45 | | | 9 | 33 | 5 | 17 | 14 | 50 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 3 | | 5 | | 8 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 5 | | 6 | | 11 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 5 | | 4 | | 9 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 5 | 18 | 3 | 18 | 8 | 36 |
| 03:00 | | | 1 | | 0 | | 1 | | 15:00 | | | 5 | | 2 | | 7 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 7 | | 6 | | 13 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 5 | | 4 | | 9 | |
| 03:45 | | | 0 | 1 | 0 | | 0 | 1 | 15:45 | | | 5 | 22 | 2 | 14 | 7 | 36 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 5 | | 5 | | 10 | |
| 04:15 | | | 1 | | 0 | | 1 | | 16:15 | | | 4 | | 6 | | 10 | |
| 04:30 | | | 2 | | 0 | | 2 | | 16:30 | | | 9 | | 4 | | 13 | |
| 04:45 | | | 4 | 7 | 0 | | 4 | 7 | 16:45 | | | 2 | 20 | 4 | 19 | 6 | 39 |
| 05:00 | | | 1 | | 1 | | 2 | | 17:00 | | | 3 | | 3 | | 6 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 4 | | 5 | | 9 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 5 | | 4 | | 9 | |
| 05:45 | | | 3 | 4 | 3 | 4 | 6 | 8 | 17:45 | | | 3 | 15 | 3 | 15 | 6 | 30 |
| 06:00 | | | 0 | | 0 | | 0 | | 18:00 | | | 1 | | 2 | | 3 | |
| 06:15 | | | 5 | | 0 | | 5 | | 18:15 | | | 3 | | 6 | | 9 | |
| 06:30 | | | 7 | | 3 | | 10 | | 18:30 | | | 7 | | 4 | | 11 | |
| 06:45 | | | 10 | 22 | 2 | 5 | 12 | 27 | 18:45 | | | 3 | 14 | 3 | 15 | 6 | 29 |
| 07:00 | | | 11 | | 3 | | 14 | | 19:00 | | | 1 | | 2 | | 3 | |
| 07:15 | | | 3 | | 3 | | 6 | | 19:15 | | | 2 | | 4 | | 6 | |
| 07:30 | | | 2 | | 5 | | 7 | | 19:30 | | | 1 | | 4 | | 5 | |
| 07:45 | | | 3 | 19 | 6 | 17 | 9 | 36 | 19:45 | | | 2 | 6 | 2 | 12 | 4 | 18 |
| 08:00 | | | 6 | | 6 | | 12 | | 20:00 | | | 1 | | 2 | | 3 | |
| 08:15 | | | 9 | | 9 | | 18 | | 20:15 | | | 3 | | 0 | | 3 | |
| 08:30 | | | 4 | | 2 | | 6 | | 20:30 | | | 3 | | 1 | | 4 | |
| 08:45 | | | 8 | 27 | 2 | 19 | 10 | 46 | 20:45 | | | 3 | 10 | 1 | 4 | 4 | 14 |
| 09:00 | | | 7 | | 6 | | 13 | | 21:00 | | | 0 | | 0 | | 0 | |
| 09:15 | | | 4 | | 7 | | 11 | | 21:15 | | | 3 | | 0 | | 3 | |
| 09:30 | | | 6 | | 3 | | 9 | | 21:30 | | | 2 | | 0 | | 2 | |
| 09:45 | | | 8 | 25 | 3 | 19 | 11 | 44 | 21:45 | | | 2 | 7 | 0 | | 2 | 7 |
| 10:00 | | | 5 | | 2 | | 7 | | 22:00 | | | 3 | | 2 | | 5 | |
| 10:15 | | | 2 | | 2 | | 4 | | 22:15 | | | 0 | | 1 | | 1 | |
| 10:30 | | | 7 | | 2 | | 9 | | 22:30 | | | 1 | | 0 | | 1 | |
| 10:45 | | | 4 | 18 | 3 | 9 | 7 | 27 | 22:45 | | | 0 | 4 | 0 | 3 | 0 | 7 |
| 11:00 | | | 9 | | 4 | | 13 | | 23:00 | | | 0 | | 0 | | 0 | |
| 11:15 | | | 8 | | 4 | | 12 | | 23:15 | | | 1 | | 0 | | 1 | |
| 11:30 | | | 8 | | 1 | | 9 | | 23:30 | | | 1 | | 1 | | 2 | |
| 11:45 | | | 5 | 30 | 2 | 11 | 7 | 41 | 23:45 | | | 1 | 3 | 1 | 2 | 2 | 5 |
| TOTALS | | | | 154 | | 84 | | 238 | TOTALS | | | | 179 | | 127 | | 306 |
| SPLIT % | | | | 64.7% | | 35.3% | | 43.8% | SPLIT % | | | | 58.5% | | 41.5% | | 56.3% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 333 | 211 | 544 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 06:15 | 07:30 | 08:15 | PM Peak Hour | | | 13:00 | 13:30 | 13:30 |
| AM Pk Volume | | | 33 | 26 | 47 | PM Pk Volume | | | 33 | 27 | 51 |
| Pk Hr Factor | | | 0.750 | 0.722 | 0.653 | Pk Hr Factor | | | 0.825 | 0.614 | 0.708 |
| 7 - 9 Volume | 0 | 0 | 46 | 36 | 82 | 4 - 6 Volume | 0 | 0 | 35 | 34 | 69 |
| 7 - 9 Peak Hour | | | 08:00 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:00 | 16:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 27 | 26 | 46 | 4 - 6 Pk Volume | 0 | 0 | 20 | 19 | 39 |
| Pk Hr Factor | 0.000 | 0.000 | 0.750 | 0.722 | 0.639 | Pk Hr Factor | 0.000 | 0.000 | 0.556 | 0.792 | 0.750 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd W/O Alisal St

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_009

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 356 | 224 | 580 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 6 | | 2 | | 8 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 3 | | 8 | | 11 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 6 | | 2 | | 8 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 8 | 23 | 1 | 13 | 9 | 36 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 9 | | 7 | | 16 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 2 | | 3 | | 5 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 5 | | 2 | | 7 | |
| 01:45 | | | 0 | 1 | 0 | | 0 | 1 | 13:45 | | | 5 | 21 | 1 | 13 | 6 | 34 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 5 | | 7 | | 12 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 5 | | 3 | | 8 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 6 | | 3 | | 9 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 7 | 23 | 4 | 17 | 11 | 40 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 5 | | 2 | | 7 | |
| 03:15 | | | 1 | | 0 | | 1 | | 15:15 | | | 4 | | 5 | | 9 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 8 | | 5 | | 13 | |
| 03:45 | | | 1 | 2 | 1 | 1 | 2 | 3 | 15:45 | | | 10 | 27 | 2 | 14 | 12 | 41 |
| 04:00 | | | 1 | | 1 | | 2 | | 16:00 | | | 18 | | 1 | | 19 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 19 | | 5 | | 24 | |
| 04:30 | | | 2 | | 0 | | 2 | | 16:30 | | | 5 | | 6 | | 11 | |
| 04:45 | | | 0 | 3 | 0 | 1 | 0 | 4 | 16:45 | | | 7 | 49 | 5 | 17 | 12 | 66 |
| 05:00 | | | 1 | | 1 | | 2 | | 17:00 | | | 5 | | 3 | | 8 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 4 | | 7 | | 11 | |
| 05:30 | | | 1 | | 0 | | 1 | | 17:30 | | | 2 | | 2 | | 4 | |
| 05:45 | | | 0 | 2 | 2 | 3 | 2 | 5 | 17:45 | | | 4 | 15 | 4 | 16 | 8 | 31 |
| 06:00 | | | 1 | | 0 | | 1 | | 18:00 | | | 3 | | 4 | | 7 | |
| 06:15 | | | 1 | | 1 | | 2 | | 18:15 | | | 5 | | 3 | | 8 | |
| 06:30 | | | 6 | | 0 | | 6 | | 18:30 | | | 3 | | 10 | | 13 | |
| 06:45 | | | 8 | 16 | 1 | 2 | 9 | 18 | 18:45 | | | 5 | 16 | 7 | 24 | 12 | 40 |
| 07:00 | | | 6 | | 2 | | 8 | | 19:00 | | | 2 | | 6 | | 8 | |
| 07:15 | | | 4 | | 1 | | 5 | | 19:15 | | | 7 | | 8 | | 15 | |
| 07:30 | | | 4 | | 1 | | 5 | | 19:30 | | | 2 | | 1 | | 3 | |
| 07:45 | | | 5 | 19 | 2 | 6 | 7 | 25 | 19:45 | | | 4 | 15 | 3 | 18 | 7 | 33 |
| 08:00 | | | 5 | | 1 | | 6 | | 20:00 | | | 1 | | 4 | | 5 | |
| 08:15 | | | 6 | | 2 | | 8 | | 20:15 | | | 0 | | 0 | | 0 | |
| 08:30 | | | 6 | | 4 | | 10 | | 20:30 | | | 0 | | 2 | | 2 | |
| 08:45 | | | 7 | 24 | 4 | 11 | 11 | 35 | 20:45 | | | 1 | 2 | 3 | 9 | 4 | 11 |
| 09:00 | | | 6 | | 2 | | 8 | | 21:00 | | | 1 | | 6 | | 7 | |
| 09:15 | | | 10 | | 2 | | 12 | | 21:15 | | | 1 | | 4 | | 5 | |
| 09:30 | | | 10 | | 3 | | 13 | | 21:30 | | | 1 | | 2 | | 3 | |
| 09:45 | | | 4 | 30 | 4 | 11 | 8 | 41 | 21:45 | | | 2 | 5 | 2 | 14 | 4 | 19 |
| 10:00 | | | 9 | | 1 | | 10 | | 22:00 | | | 4 | | 1 | | 5 | |
| 10:15 | | | 6 | | 2 | | 8 | | 22:15 | | | 2 | | 1 | | 3 | |
| 10:30 | | | 7 | | 3 | | 10 | | 22:30 | | | 3 | | 3 | | 6 | |
| 10:45 | | | 4 | 26 | 3 | 9 | 7 | 35 | 22:45 | | | 1 | 10 | 1 | 6 | 2 | 16 |
| 11:00 | | | 4 | | 4 | | 8 | | 23:00 | | | 2 | | 3 | | 5 | |
| 11:15 | | | 5 | | 2 | | 7 | | 23:15 | | | 3 | | 4 | | 7 | |
| 11:30 | | | 5 | | 3 | | 8 | | 23:30 | | | 1 | | 1 | | 2 | |
| 11:45 | | | 4 | 18 | 1 | 10 | 5 | 28 | 23:45 | | | 3 | 9 | 1 | 9 | 4 | 18 |
| TOTALS | | | | 141 | | 54 | | 195 | TOTALS | | | | 215 | | 170 | | 385 |
| SPLIT % | | | | 72.3% | | 27.7% | | 33.6% | SPLIT % | | | | 55.8% | | 44.2% | | 66.4% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 356 | 224 | 580 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 08:45 | 11:30 | 08:45 | PM Peak Hour | | | 15:30 | 18:30 | 15:30 |
| AM Pk Volume | | | 33 | 14 | 44 | PM Pk Volume | | | 55 | 31 | 68 |
| Pk Hr Factor | | | 0.825 | 0.438 | 0.846 | Pk Hr Factor | | | 0.724 | 0.775 | 0.708 |
| 7 - 9 Volume | 0 | 0 | 43 | 17 | 60 | 4 - 6 Volume | 0 | 0 | 64 | 33 | 97 |
| 7 - 9 Peak Hour | | | 08:00 | 08:00 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 16:30 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 24 | 11 | 35 | 4 - 6 Pk Volume | 0 | 0 | 49 | 21 | 66 |
| Pk Hr Factor | 0.000 | 0.000 | 0.857 | 0.688 | 0.795 | Pk Hr Factor | 0.000 | 0.000 | 0.645 | 0.750 | 0.688 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Alisal St

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_010

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 427 | 414 | 841 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 4 | | 3 | | 7 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 12 | | 5 | | 17 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 6 | | 3 | | 9 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 13 | 35 | 9 | 20 | 22 | 55 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 14 | | 7 | | 21 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 10 | | 6 | | 16 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 7 | | 14 | | 21 | |
| 01:45 | | | 0 | | 0 | | 0 | | 13:45 | | | 6 | 37 | 1 | 28 | 7 | 65 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 13 | | 4 | | 17 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 11 | | 12 | | 23 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 7 | | 10 | | 17 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 10 | 41 | 22 | 48 | 32 | 89 |
| 03:00 | | | 1 | | 0 | | 1 | | 15:00 | | | 9 | | 26 | | 35 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 6 | | 17 | | 23 | |
| 03:30 | | | 0 | | 1 | | 1 | | 15:30 | | | 6 | | 9 | | 15 | |
| 03:45 | | | 0 | 1 | 0 | 1 | 0 | 2 | 15:45 | | | 2 | 23 | 6 | 58 | 8 | 81 |
| 04:00 | | | 1 | | 1 | | 2 | | 16:00 | | | 8 | | 8 | | 16 | |
| 04:15 | | | 3 | | 1 | | 4 | | 16:15 | | | 6 | | 7 | | 13 | |
| 04:30 | | | 2 | | 0 | | 2 | | 16:30 | | | 5 | | 16 | | 21 | |
| 04:45 | | | 6 | 12 | 0 | 2 | 6 | 14 | 16:45 | | | 4 | 23 | 4 | 35 | 8 | 58 |
| 05:00 | | | 0 | | 0 | | 0 | | 17:00 | | | 9 | | 2 | | 11 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 2 | | 7 | | 9 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 12 | | 6 | | 18 | |
| 05:45 | | | 2 | 2 | 0 | | 2 | 2 | 17:45 | | | 6 | 29 | 18 | 33 | 24 | 62 |
| 06:00 | | | 2 | | 1 | | 3 | | 18:00 | | | 5 | | 9 | | 14 | |
| 06:15 | | | 1 | | 1 | | 2 | | 18:15 | | | 8 | | 9 | | 17 | |
| 06:30 | | | 6 | | 1 | | 7 | | 18:30 | | | 3 | | 13 | | 16 | |
| 06:45 | | | 9 | 18 | 1 | 4 | 10 | 22 | 18:45 | | | 3 | 19 | 9 | 40 | 12 | 59 |
| 07:00 | | | 11 | | 4 | | 15 | | 19:00 | | | 1 | | 9 | | 10 | |
| 07:15 | | | 9 | | 2 | | 11 | | 19:15 | | | 5 | | 9 | | 14 | |
| 07:30 | | | 2 | | 9 | | 11 | | 19:30 | | | 7 | | 8 | | 15 | |
| 07:45 | | | 4 | 26 | 7 | 22 | 11 | 48 | 19:45 | | | 3 | 16 | 9 | 35 | 12 | 51 |
| 08:00 | | | 7 | | 4 | | 11 | | 20:00 | | | 3 | | 4 | | 7 | |
| 08:15 | | | 7 | | 3 | | 10 | | 20:15 | | | 3 | | 1 | | 4 | |
| 08:30 | | | 17 | | 8 | | 25 | | 20:30 | | | 5 | | 2 | | 7 | |
| 08:45 | | | 9 | 40 | 7 | 22 | 16 | 62 | 20:45 | | | 2 | 13 | 1 | 8 | 3 | 21 |
| 09:00 | | | 8 | | 2 | | 10 | | 21:00 | | | 2 | | 0 | | 2 | |
| 09:15 | | | 6 | | 7 | | 13 | | 21:15 | | | 1 | | 1 | | 2 | |
| 09:30 | | | 10 | | 1 | | 11 | | 21:30 | | | 2 | | 0 | | 2 | |
| 09:45 | | | 13 | 37 | 2 | 12 | 15 | 49 | 21:45 | | | 2 | 7 | 0 | 1 | 2 | 8 |
| 10:00 | | | 5 | | 4 | | 9 | | 22:00 | | | 1 | | 2 | | 3 | |
| 10:15 | | | 4 | | 6 | | 10 | | 22:15 | | | 0 | | 0 | | 0 | |
| 10:30 | | | 7 | | 3 | | 10 | | 22:30 | | | 1 | | 0 | | 1 | |
| 10:45 | | | 9 | 25 | 6 | 19 | 15 | 44 | 22:45 | | | 0 | 2 | 0 | 2 | 0 | 4 |
| 11:00 | | | 5 | | 6 | | 11 | | 23:00 | | | 0 | | 0 | | 0 | |
| 11:15 | | | 1 | | 0 | | 1 | | 23:15 | | | 0 | | 0 | | 0 | |
| 11:30 | | | 6 | | 7 | | 13 | | 23:30 | | | 2 | | 0 | | 2 | |
| 11:45 | | | 7 | 19 | 10 | 23 | 17 | 42 | 23:45 | | | 0 | 2 | 1 | 1 | 1 | 3 |
| TOTALS | | | | 180 | | 105 | | 285 | TOTALS | | | | 247 | | 309 | | 556 |
| SPLIT % | | | | 63.2% | | 36.8% | | 33.9% | SPLIT % | | | | 44.4% | | 55.6% | | 66.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 427 | 414 | 841 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 08:15 | 11:30 | 08:30 | PM Peak Hour | | | 12:15 | 14:30 | 14:15 |
| AM Pk Volume | | | 41 | 25 | 64 | PM Pk Volume | | | 45 | 75 | 107 |
| Pk Hr Factor | | | 0.603 | 0.625 | 0.640 | Pk Hr Factor | | | 0.804 | 0.721 | 0.764 |
| 7 - 9 Volume | 0 | 0 | 66 | 44 | 110 | 4 - 6 Volume | 0 | 0 | 52 | 68 | 120 |
| 7 - 9 Peak Hour | | | 08:00 | 07:30 | 08:00 | 4 - 6 Peak Hour | | | 17:00 | 16:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 40 | 23 | 62 | 4 - 6 Pk Volume | 0 | 0 | 29 | 35 | 62 |
| Pk Hr Factor | 0.000 | 0.000 | 0.588 | 0.639 | 0.620 | Pk Hr Factor | 0.000 | 0.000 | 0.604 | 0.547 | 0.646 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Alisal St

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_010

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 451 | 446 | 897 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 1 | | 2 | | 12:00 | | | 5 | | 7 | | 12 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 19 | | 4 | | 23 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 6 | | 11 | | 17 | |
| 00:45 | | | 0 | 1 | 0 | 1 | 0 | 2 | 12:45 | | | 9 | 39 | 4 | 26 | 13 | 65 |
| 01:00 | | | 1 | | 1 | | 2 | | 13:00 | | | 9 | | 9 | | 18 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 7 | | 2 | | 9 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 11 | | 26 | | 37 | |
| 01:45 | | | 0 | 1 | 0 | 1 | 0 | 2 | 13:45 | | | 8 | 35 | 10 | 47 | 18 | 82 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 8 | | 9 | | 17 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 5 | | 14 | | 19 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 3 | | 8 | | 11 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 11 | 27 | 8 | 39 | 19 | 66 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 4 | | 12 | | 16 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 11 | | 9 | | 20 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 4 | | 11 | | 15 | |
| 03:45 | | | 0 | | 0 | | 0 | | 15:45 | | | 6 | 25 | 8 | 40 | 14 | 65 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 9 | | 8 | | 17 | |
| 04:15 | | | 2 | | 0 | | 2 | | 16:15 | | | 6 | | 17 | | 23 | |
| 04:30 | | | 3 | | 0 | | 3 | | 16:30 | | | 6 | | 8 | | 14 | |
| 04:45 | | | 7 | 12 | 0 | | 7 | 12 | 16:45 | | | 4 | 25 | 5 | 38 | 9 | 63 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 1 | | 6 | | 7 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 7 | | 11 | | 18 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 7 | | 14 | | 21 | |
| 05:45 | | | 4 | 5 | 1 | 1 | 5 | 6 | 17:45 | | | 5 | 20 | 12 | 43 | 17 | 63 |
| 06:00 | | | 0 | | 0 | | 0 | | 18:00 | | | 1 | | 10 | | 11 | |
| 06:15 | | | 5 | | 1 | | 6 | | 18:15 | | | 4 | | 16 | | 20 | |
| 06:30 | | | 13 | | 6 | | 19 | | 18:30 | | | 6 | | 12 | | 18 | |
| 06:45 | | | 11 | 29 | 4 | 11 | 15 | 40 | 18:45 | | | 4 | 15 | 12 | 50 | 16 | 65 |
| 07:00 | | | 16 | | 3 | | 19 | | 19:00 | | | 4 | | 8 | | 12 | |
| 07:15 | | | 9 | | 3 | | 12 | | 19:15 | | | 3 | | 11 | | 14 | |
| 07:30 | | | 6 | | 2 | | 8 | | 19:30 | | | 2 | | 22 | | 24 | |
| 07:45 | | | 3 | 34 | 8 | 16 | 11 | 50 | 19:45 | | | 4 | 13 | 3 | 44 | 7 | 57 |
| 08:00 | | | 7 | | 6 | | 13 | | 20:00 | | | 1 | | 2 | | 3 | |
| 08:15 | | | 14 | | 10 | | 24 | | 20:15 | | | 4 | | 1 | | 5 | |
| 08:30 | | | 8 | | 3 | | 11 | | 20:30 | | | 2 | | 1 | | 3 | |
| 08:45 | | | 13 | 42 | 3 | 22 | 16 | 64 | 20:45 | | | 3 | 10 | 3 | 7 | 6 | 17 |
| 09:00 | | | 12 | | 9 | | 21 | | 21:00 | | | 0 | | 0 | | 0 | |
| 09:15 | | | 5 | | 6 | | 11 | | 21:15 | | | 2 | | 0 | | 2 | |
| 09:30 | | | 13 | | 0 | | 13 | | 21:30 | | | 2 | | 1 | | 3 | |
| 09:45 | | | 13 | 43 | 4 | 19 | 17 | 62 | 21:45 | | | 2 | 6 | 0 | 1 | 2 | 7 |
| 10:00 | | | 10 | | 1 | | 11 | | 22:00 | | | 4 | | 2 | | 6 | |
| 10:15 | | | 3 | | 2 | | 5 | | 22:15 | | | 0 | | 1 | | 1 | |
| 10:30 | | | 8 | | 7 | | 15 | | 22:30 | | | 1 | | 1 | | 2 | |
| 10:45 | | | 6 | 27 | 8 | 18 | 14 | 45 | 22:45 | | | 0 | 5 | 0 | 4 | 0 | 9 |
| 11:00 | | | 16 | | 4 | | 20 | | 23:00 | | | 0 | | 0 | | 0 | |
| 11:15 | | | 8 | | 10 | | 18 | | 23:15 | | | 1 | | 0 | | 1 | |
| 11:30 | | | 5 | | 0 | | 5 | | 23:30 | | | 0 | | 1 | | 1 | |
| 11:45 | | | 6 | 35 | 3 | 17 | 9 | 52 | 23:45 | | | 1 | 2 | 0 | 1 | 1 | 3 |
| TOTALS | | | | 229 | | 106 | | 335 | TOTALS | | | | 222 | | 340 | | 562 |
| SPLIT % | | | | 68.4% | | 31.6% | | 37.3% | SPLIT % | | | | 39.5% | | 60.5% | | 62.7% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 451 | 446 | 897 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 06:30 | 10:30 | 08:15 | PM Peak Hour | | | 12:15 | 13:30 | 13:30 |
| AM Pk Volume | | | 49 | 29 | 72 | PM Pk Volume | | | 43 | 59 | 91 |
| Pk Hr Factor | | | 0.766 | 0.725 | 0.750 | Pk Hr Factor | | | 0.566 | 0.567 | 0.615 |
| 7 - 9 Volume | 0 | 0 | 76 | 38 | 114 | 4 - 6 Volume | 0 | 0 | 45 | 81 | 126 |
| 7 - 9 Peak Hour | | | 08:00 | 07:45 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 17:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 42 | 27 | 64 | 4 - 6 Pk Volume | 0 | 0 | 25 | 43 | 63 |
| Pk Hr Factor | 0.000 | 0.000 | 0.750 | 0.675 | 0.667 | Pk Hr Factor | 0.000 | 0.000 | 0.694 | 0.768 | 0.685 |

Prepared by NDS/ATD

# VOLUME

Happy Valley Rd E/O Alisal St

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_010

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 430 | 416 | 846 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 0 | | 0 | | 0 | | 12:00 | | | 7 | | 6 | | 13 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 8 | | 9 | | 17 | |
| 00:30 | | | 0 | | 0 | | 0 | | 12:30 | | | 7 | | 3 | | 10 | |
| 00:45 | | | 0 | | 0 | | 0 | | 12:45 | | | 7 | 29 | 2 | 20 | 9 | 49 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 13 | | 14 | | 27 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 8 | | 3 | | 11 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 5 | | 5 | | 10 | |
| 01:45 | | | 0 | | 0 | | 0 | | 13:45 | | | 6 | 32 | 2 | 24 | 8 | 56 |
| 02:00 | | | 0 | | 0 | | 0 | | 14:00 | | | 6 | | 11 | | 17 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 10 | | 7 | | 17 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 6 | | 7 | | 13 | |
| 02:45 | | | 0 | | 0 | | 0 | | 14:45 | | | 11 | 33 | 10 | 35 | 21 | 68 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 6 | | 2 | | 8 | |
| 03:15 | | | 2 | | 0 | | 2 | | 15:15 | | | 7 | | 8 | | 15 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 7 | | 11 | | 18 | |
| 03:45 | | | 0 | 2 | 0 | | 0 | 2 | 15:45 | | | 16 | 36 | 3 | 24 | 19 | 60 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 23 | | 4 | | 27 | |
| 04:15 | | | 1 | | 0 | | 1 | | 16:15 | | | 24 | | 14 | | 38 | |
| 04:30 | | | 2 | | 0 | | 2 | | 16:30 | | | 8 | | 11 | | 19 | |
| 04:45 | | | 1 | 4 | 0 | | 1 | 4 | 16:45 | | | 6 | 61 | 19 | 48 | 25 | 109 |
| 05:00 | | | 2 | | 1 | | 3 | | 17:00 | | | 4 | | 7 | | 11 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 3 | | 14 | | 17 | |
| 05:30 | | | 0 | | 0 | | 0 | | 17:30 | | | 2 | | 4 | | 6 | |
| 05:45 | | | 2 | 4 | 0 | 1 | 2 | 5 | 17:45 | | | 4 | 13 | 8 | 33 | 12 | 46 |
| 06:00 | | | 0 | | 0 | | 0 | | 18:00 | | | 7 | | 7 | | 14 | |
| 06:15 | | | 5 | | 0 | | 5 | | 18:15 | | | 7 | | 4 | | 11 | |
| 06:30 | | | 9 | | 0 | | 9 | | 18:30 | | | 1 | | 14 | | 15 | |
| 06:45 | | | 9 | 23 | 1 | 1 | 10 | 24 | 18:45 | | | 1 | 16 | 19 | 44 | 20 | 60 |
| 07:00 | | | 9 | | 0 | | 9 | | 19:00 | | | 3 | | 14 | | 17 | |
| 07:15 | | | 7 | | 1 | | 8 | | 19:15 | | | 4 | | 12 | | 16 | |
| 07:30 | | | 5 | | 1 | | 6 | | 19:30 | | | 0 | | 7 | | 7 | |
| 07:45 | | | 4 | 25 | 1 | 3 | 5 | 28 | 19:45 | | | 3 | 10 | 3 | 36 | 6 | 46 |
| 08:00 | | | 8 | | 1 | | 9 | | 20:00 | | | 2 | | 8 | | 10 | |
| 08:15 | | | 8 | | 0 | | 8 | | 20:15 | | | 0 | | 1 | | 1 | |
| 08:30 | | | 7 | | 4 | | 11 | | 20:30 | | | 0 | | 3 | | 3 | |
| 08:45 | | | 9 | 32 | 6 | 11 | 15 | 43 | 20:45 | | | 0 | 2 | 5 | 17 | 5 | 19 |
| 09:00 | | | 8 | | 1 | | 9 | | 21:00 | | | 0 | | 16 | | 16 | |
| 09:15 | | | 11 | | 5 | | 16 | | 21:15 | | | 2 | | 11 | | 13 | |
| 09:30 | | | 9 | | 4 | | 13 | | 21:30 | | | 1 | | 2 | | 3 | |
| 09:45 | | | 4 | 32 | 5 | 15 | 9 | 47 | 21:45 | | | 1 | 4 | 7 | 36 | 8 | 40 |
| 10:00 | | | 12 | | 6 | | 18 | | 22:00 | | | 2 | | 3 | | 5 | |
| 10:15 | | | 9 | | 6 | | 15 | | 22:15 | | | 1 | | 2 | | 3 | |
| 10:30 | | | 6 | | 7 | | 13 | | 22:30 | | | 3 | | 11 | | 14 | |
| 10:45 | | | 6 | 33 | 10 | 29 | 16 | 62 | 22:45 | | | 0 | 6 | 2 | 18 | 2 | 24 |
| 11:00 | | | 8 | | 6 | | 14 | | 23:00 | | | 0 | | 1 | | 1 | |
| 11:15 | | | 9 | | 2 | | 11 | | 23:15 | | | 1 | | 3 | | 4 | |
| 11:30 | | | 5 | | 4 | | 9 | | 23:30 | | | 1 | | 0 | | 1 | |
| 11:45 | | | 7 | 29 | 5 | 17 | 12 | 46 | 23:45 | | | 2 | 4 | 0 | 4 | 2 | 8 |
| TOTALS | | | | 184 | | 77 | | 261 | TOTALS | | | | 246 | | 339 | | 585 |
| SPLIT % | | | | 70.5% | | 29.5% | | 30.9% | SPLIT % | | | | 42.1% | | 57.9% | | 69.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 430 | 416 | 846 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 08:45 | 10:00 | 10:00 | PM Peak Hour | | | 15:45 | 18:30 | 16:00 |
| AM Pk Volume | | | 37 | 29 | 62 | PM Pk Volume | | | 71 | 59 | 109 |
| Pk Hr Factor | | | 0.841 | 0.725 | 0.861 | Pk Hr Factor | | | 0.740 | 0.776 | 0.717 |
| 7 - 9 Volume | 0 | 0 | 57 | 14 | 71 | 4 - 6 Volume | 0 | 0 | 74 | 81 | 155 |
| 7 - 9 Peak Hour | | | 08:00 | 08:00 | 08:00 | 4 - 6 Peak Hour | | | 16:00 | 16:15 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 32 | 11 | 43 | 4 - 6 Pk Volume | 0 | 0 | 61 | 51 | 109 |
| Pk Hr Factor | 0.000 | 0.000 | 0.889 | 0.458 | 0.717 | Pk Hr Factor | 0.000 | 0.000 | 0.635 | 0.671 | 0.717 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Summit Creek Ln

**Day:** Thursday
**Date:** 3/16/2017

**City:** Pleasanton
**Project #:** CA17_7212_011

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 417 | 383 | 800 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 1 | | 0 | | 1 | | 12:00 | | | 6 | | 8 | | 14 | |
| 00:15 | | | 0 | | 0 | | 0 | | 12:15 | | | 5 | | 3 | | 8 | |
| 00:30 | | | 1 | | 3 | | 4 | | 12:30 | | | 7 | | 10 | | 17 | |
| 00:45 | | | 0 | 2 | 0 | 3 | 0 | 5 | 12:45 | | | 8 | 26 | 6 | 27 | 14 | 53 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 7 | | 3 | | 10 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 5 | | 4 | | 9 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 2 | | 1 | | 3 | |
| 01:45 | | | 0 | 1 | 0 | | 0 | 1 | 13:45 | | | 3 | 17 | 7 | 15 | 10 | 32 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 9 | | 9 | | 18 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 3 | | 7 | | 10 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 7 | | 8 | | 15 | |
| 02:45 | | | 0 | 1 | 0 | | 0 | 1 | 14:45 | | | 6 | 25 | 1 | 25 | 7 | 50 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 14 | | 7 | | 21 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 15 | | 3 | | 18 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 8 | | 5 | | 13 | |
| 03:45 | | | 0 | | 0 | | 0 | | 15:45 | | | 8 | 45 | 5 | 20 | 13 | 65 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 3 | | 12 | | 15 | |
| 04:15 | | | 1 | | 1 | | 2 | | 16:15 | | | 10 | | 6 | | 16 | |
| 04:30 | | | 0 | | 2 | | 2 | | 16:30 | | | 6 | | 6 | | 12 | |
| 04:45 | | | 0 | 1 | 2 | 5 | 2 | 6 | 16:45 | | | 9 | 28 | 6 | 30 | 15 | 58 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 4 | | 8 | | 12 | |
| 05:15 | | | 0 | | 1 | | 1 | | 17:15 | | | 3 | | 5 | | 8 | |
| 05:30 | | | 0 | | 1 | | 1 | | 17:30 | | | 8 | | 6 | | 14 | |
| 05:45 | | | 0 | 1 | 1 | 3 | 1 | 4 | 17:45 | | | 9 | 24 | 10 | 29 | 19 | 53 |
| 06:00 | | | 1 | | 2 | | 3 | | 18:00 | | | 13 | | 2 | | 15 | |
| 06:15 | | | 0 | | 3 | | 3 | | 18:15 | | | 10 | | 5 | | 15 | |
| 06:30 | | | 0 | | 2 | | 2 | | 18:30 | | | 3 | | 4 | | 7 | |
| 06:45 | | | 1 | 2 | 7 | 14 | 8 | 16 | 18:45 | | | 12 | 38 | 9 | 20 | 21 | 58 |
| 07:00 | | | 2 | | 5 | | 7 | | 19:00 | | | 8 | | 4 | | 12 | |
| 07:15 | | | 2 | | 10 | | 12 | | 19:15 | | | 10 | | 5 | | 15 | |
| 07:30 | | | 6 | | 18 | | 24 | | 19:30 | | | 8 | | 4 | | 12 | |
| 07:45 | | | 6 | 16 | 10 | 43 | 16 | 59 | 19:45 | | | 11 | 37 | 6 | 19 | 17 | 56 |
| 08:00 | | | 10 | | 16 | | 26 | | 20:00 | | | 7 | | 3 | | 10 | |
| 08:15 | | | 13 | | 15 | | 28 | | 20:15 | | | 10 | | 2 | | 12 | |
| 08:30 | | | 5 | | 6 | | 11 | | 20:30 | | | 5 | | 1 | | 6 | |
| 08:45 | | | 10 | 38 | 8 | 45 | 18 | 83 | 20:45 | | | 7 | 29 | 2 | 8 | 9 | 37 |
| 09:00 | | | 2 | | 11 | | 13 | | 21:00 | | | 4 | | 2 | | 6 | |
| 09:15 | | | 1 | | 7 | | 8 | | 21:15 | | | 3 | | 1 | | 4 | |
| 09:30 | | | 5 | | 4 | | 9 | | 21:30 | | | 8 | | 2 | | 10 | |
| 09:45 | | | 3 | 11 | 7 | 29 | 10 | 40 | 21:45 | | | 5 | 20 | 1 | 6 | 6 | 26 |
| 10:00 | | | 2 | | 4 | | 6 | | 22:00 | | | 3 | | 1 | | 4 | |
| 10:15 | | | 3 | | 4 | | 7 | | 22:15 | | | 3 | | 0 | | 3 | |
| 10:30 | | | 5 | | 6 | | 11 | | 22:30 | | | 2 | | 0 | | 2 | |
| 10:45 | | | 6 | 16 | 5 | 19 | 11 | 35 | 22:45 | | | 0 | 8 | 0 | 1 | 0 | 9 |
| 11:00 | | | 8 | | 5 | | 13 | | 23:00 | | | 1 | | 2 | | 3 | |
| 11:15 | | | 4 | | 2 | | 6 | | 23:15 | | | 3 | | 0 | | 3 | |
| 11:30 | | | 9 | | 8 | | 17 | | 23:30 | | | 1 | | 0 | | 1 | |
| 11:45 | | | 4 | 25 | 5 | 20 | 9 | 45 | 23:45 | | | 1 | 6 | 0 | 2 | 1 | 8 |
| TOTALS | | | | 114 | | 181 | | 295 | TOTALS | | | | 303 | | 202 | | 505 |
| SPLIT % | | | | 38.6% | | 61.4% | | 36.9% | SPLIT % | | | | 60.0% | | 40.0% | | 63.1% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 417 | 383 | 800 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 08:00 | 07:30 | 07:30 | PM Peak Hour | | | 15:00 | 13:45 | 15:00 |
| AM Pk Volume | | | 38 | 59 | 94 | PM Pk Volume | | | 45 | 31 | 65 |
| Pk Hr Factor | | | 0.731 | 0.819 | 0.839 | Pk Hr Factor | | | 0.750 | 0.861 | 0.774 |
| 7 - 9 Volume | 0 | 0 | 54 | 88 | 142 | 4 - 6 Volume | 0 | 0 | 52 | 59 | 111 |
| 7 - 9 Peak Hour | | | 08:00 | 07:30 | 07:30 | 4 - 6 Peak Hour | | | 16:15 | 16:00 | 16:00 |
| 7 - 9 Pk Volume | 0 | 0 | 38 | 59 | 94 | 4 - 6 Pk Volume | 0 | 0 | 29 | 30 | 58 |
| Pk Hr Factor | 0.000 | 0.000 | 0.731 | 0.819 | 0.839 | Pk Hr Factor | 0.000 | 0.000 | 0.725 | 0.625 | 0.906 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Summit Creek Ln

**Day:** Friday
**Date:** 3/17/2017

**City:** Pleasanton
**Project #:** CA17_7212_011

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 478 | 462 | 940 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 2 | | 1 | | 3 | | 12:00 | | | 4 | | 8 | | 12 | |
| 00:15 | | | 1 | | 0 | | 1 | | 12:15 | | | 9 | | 4 | | 13 | |
| 00:30 | | | 0 | | 1 | | 1 | | 12:30 | | | 4 | | 10 | | 14 | |
| 00:45 | | | 1 | 4 | 0 | 2 | 1 | 6 | 12:45 | | | 3 | 20 | 10 | 32 | 13 | 52 |
| 01:00 | | | 1 | | 0 | | 1 | | 13:00 | | | 3 | | 3 | | 6 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 11 | | 1 | | 12 | |
| 01:30 | | | 1 | | 1 | | 2 | | 13:30 | | | 6 | | 7 | | 13 | |
| 01:45 | | | 0 | 2 | 0 | 1 | 0 | 3 | 13:45 | | | 3 | 23 | 8 | 19 | 11 | 42 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 9 | | 7 | | 16 | |
| 02:15 | | | 0 | | 0 | | 0 | | 14:15 | | | 7 | | 5 | | 12 | |
| 02:30 | | | 0 | | 0 | | 0 | | 14:30 | | | 5 | | 14 | | 19 | |
| 02:45 | | | 1 | 2 | 1 | 1 | 2 | 3 | 14:45 | | | 8 | 29 | 5 | 31 | 13 | 60 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 12 | | 7 | | 19 | |
| 03:15 | | | 0 | | 1 | | 1 | | 15:15 | | | 18 | | 6 | | 24 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 11 | | 9 | | 20 | |
| 03:45 | | | 0 | | 0 | 1 | 0 | 1 | 15:45 | | | 6 | 47 | 12 | 34 | 18 | 81 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 13 | | 9 | | 22 | |
| 04:15 | | | 1 | | 1 | | 2 | | 16:15 | | | 8 | | 7 | | 15 | |
| 04:30 | | | 0 | | 0 | | 0 | | 16:30 | | | 7 | | 6 | | 13 | |
| 04:45 | | | 0 | 1 | 2 | 3 | 2 | 4 | 16:45 | | | 9 | 37 | 10 | 32 | 19 | 69 |
| 05:00 | | | 1 | | 0 | | 1 | | 17:00 | | | 11 | | 10 | | 21 | |
| 05:15 | | | 0 | | 2 | | 2 | | 17:15 | | | 10 | | 7 | | 17 | |
| 05:30 | | | 0 | | 1 | | 1 | | 17:30 | | | 16 | | 5 | | 21 | |
| 05:45 | | | 0 | 1 | 1 | 4 | 1 | 5 | 17:45 | | | 12 | 49 | 9 | 31 | 21 | 80 |
| 06:00 | | | 0 | | 1 | | 1 | | 18:00 | | | 11 | | 10 | | 21 | |
| 06:15 | | | 0 | | 3 | | 3 | | 18:15 | | | 10 | | 12 | | 22 | |
| 06:30 | | | 2 | | 3 | | 5 | | 18:30 | | | 7 | | 3 | | 10 | |
| 06:45 | | | 2 | 4 | 5 | 12 | 7 | 16 | 18:45 | | | 8 | 36 | 5 | 30 | 13 | 66 |
| 07:00 | | | 1 | | 3 | | 4 | | 19:00 | | | 12 | | 9 | | 21 | |
| 07:15 | | | 4 | | 10 | | 14 | | 19:15 | | | 11 | | 6 | | 17 | |
| 07:30 | | | 5 | | 21 | | 26 | | 19:30 | | | 10 | | 6 | | 16 | |
| 07:45 | | | 10 | 20 | 16 | 50 | 26 | 70 | 19:45 | | | 6 | 39 | 3 | 24 | 9 | 63 |
| 08:00 | | | 12 | | 15 | | 27 | | 20:00 | | | 7 | | 6 | | 13 | |
| 08:15 | | | 8 | | 7 | | 15 | | 20:15 | | | 6 | | 9 | | 15 | |
| 08:30 | | | 7 | | 3 | | 10 | | 20:30 | | | 3 | | 2 | | 5 | |
| 08:45 | | | 6 | 33 | 14 | 39 | 20 | 72 | 20:45 | | | 12 | 28 | 1 | 18 | 13 | 46 |
| 09:00 | | | 5 | | 5 | | 10 | | 21:00 | | | 5 | | 3 | | 8 | |
| 09:15 | | | 9 | | 5 | | 14 | | 21:15 | | | 5 | | 2 | | 7 | |
| 09:30 | | | 2 | | 5 | | 7 | | 21:30 | | | 6 | | 3 | | 9 | |
| 09:45 | | | 2 | 18 | 15 | 30 | 17 | 48 | 21:45 | | | 1 | 17 | 3 | 11 | 4 | 28 |
| 10:00 | | | 4 | | 3 | | 7 | | 22:00 | | | 6 | | 3 | | 9 | |
| 10:15 | | | 3 | | 8 | | 11 | | 22:15 | | | 4 | | 0 | | 4 | |
| 10:30 | | | 6 | | 9 | | 15 | | 22:30 | | | 6 | | 0 | | 6 | |
| 10:45 | | | 7 | 20 | 4 | 24 | 11 | 44 | 22:45 | | | 7 | 23 | 1 | 4 | 8 | 27 |
| 11:00 | | | 9 | | 7 | | 16 | | 23:00 | | | 2 | | 0 | | 2 | |
| 11:15 | | | 5 | | 7 | | 12 | | 23:15 | | | 0 | | 0 | | 0 | |
| 11:30 | | | 5 | | 7 | | 12 | | 23:30 | | | 0 | | 1 | | 1 | |
| 11:45 | | | 2 | 21 | 6 | 27 | 8 | 48 | 23:45 | | | 2 | 4 | 1 | 2 | 3 | 6 |
| TOTALS | | | | 126 | | 194 | | 320 | TOTALS | | | | 352 | | 268 | | 620 |
| SPLIT % | | | | 39.4% | | 60.6% | | 34.0% | SPLIT % | | | | 56.8% | | 43.2% | | 66.0% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 478 | 462 | 940 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 07:45 | 07:15 | 07:30 | PM Peak Hour | | | 14:45 | 15:30 | 17:30 |
| AM Pk Volume | | | 37 | 62 | 94 | PM Pk Volume | | | 49 | 37 | 85 |
| Pk Hr Factor | | | 0.771 | 0.738 | 0.870 | Pk Hr Factor | | | 0.681 | 0.771 | 0.966 |
| 7 - 9 Volume | 0 | 0 | 53 | 89 | 142 | 4 - 6 Volume | 0 | 0 | 86 | 63 | 149 |
| 7 - 9 Peak Hour | | | 07:45 | 07:15 | 07:30 | 4 - 6 Peak Hour | | | 17:00 | 16:15 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 37 | 62 | 94 | 4 - 6 Pk Volume | 0 | 0 | 49 | 33 | 80 |
| Pk Hr Factor | 0.000 | 0.000 | 0.771 | 0.738 | 0.870 | Pk Hr Factor | 0.000 | 0.000 | 0.766 | 0.825 | 0.952 |

Prepared by NDS/ATD

# VOLUME

Sycamore Creek Way E/O Summit Creek Ln

**Day:** Saturday
**Date:** 3/18/2017

**City:** Pleasanton
**Project #:** CA17_7212_011

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 438 | 412 | 850 |

| AM Period | NB | SB | EB | | WB | | TOTAL | | PM Period | NB | SB | EB | | WB | | TOTAL | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 00:00 | | | 3 | | 0 | | 3 | | 12:00 | | | 14 | | 9 | | 23 | |
| 00:15 | | | 1 | | 3 | | 4 | | 12:15 | | | 13 | | 8 | | 21 | |
| 00:30 | | | 2 | | 1 | | 3 | | 12:30 | | | 4 | | 7 | | 11 | |
| 00:45 | | | 3 | 9 | 0 | 4 | 3 | 13 | 12:45 | | | 7 | 38 | 8 | 32 | 15 | 70 |
| 01:00 | | | 0 | | 0 | | 0 | | 13:00 | | | 5 | | 8 | | 13 | |
| 01:15 | | | 0 | | 0 | | 0 | | 13:15 | | | 10 | | 10 | | 20 | |
| 01:30 | | | 0 | | 0 | | 0 | | 13:30 | | | 8 | | 6 | | 14 | |
| 01:45 | | | 1 | 1 | 1 | 1 | 2 | 2 | 13:45 | | | 9 | 32 | 6 | 30 | 15 | 62 |
| 02:00 | | | 1 | | 0 | | 1 | | 14:00 | | | 8 | | 7 | | 15 | |
| 02:15 | | | 1 | | 0 | | 1 | | 14:15 | | | 7 | | 10 | | 17 | |
| 02:30 | | | 1 | | 0 | | 1 | | 14:30 | | | 4 | | 1 | | 5 | |
| 02:45 | | | 0 | 3 | 0 | | 0 | 3 | 14:45 | | | 17 | 36 | 6 | 24 | 23 | 60 |
| 03:00 | | | 0 | | 0 | | 0 | | 15:00 | | | 6 | | 5 | | 11 | |
| 03:15 | | | 0 | | 0 | | 0 | | 15:15 | | | 10 | | 8 | | 18 | |
| 03:30 | | | 0 | | 0 | | 0 | | 15:30 | | | 5 | | 12 | | 17 | |
| 03:45 | | | 0 | | 0 | | 0 | | 15:45 | | | 5 | 26 | 10 | 35 | 15 | 61 |
| 04:00 | | | 0 | | 0 | | 0 | | 16:00 | | | 10 | | 5 | | 15 | |
| 04:15 | | | 0 | | 0 | | 0 | | 16:15 | | | 8 | | 4 | | 12 | |
| 04:30 | | | 0 | | 0 | | 0 | | 16:30 | | | 9 | | 4 | | 13 | |
| 04:45 | | | 0 | | 0 | | 0 | | 16:45 | | | 10 | 37 | 3 | 16 | 13 | 53 |
| 05:00 | | | 0 | | 1 | | 1 | | 17:00 | | | 9 | | 6 | | 15 | |
| 05:15 | | | 0 | | 0 | | 0 | | 17:15 | | | 6 | | 6 | | 12 | |
| 05:30 | | | 1 | | 1 | | 2 | | 17:30 | | | 10 | | 9 | | 19 | |
| 05:45 | | | 0 | 1 | 0 | 2 | 0 | 3 | 17:45 | | | 11 | 36 | 6 | 27 | 17 | 63 |
| 06:00 | | | 0 | | 1 | | 1 | | 18:00 | | | 9 | | 7 | | 16 | |
| 06:15 | | | 0 | | 3 | | 3 | | 18:15 | | | 10 | | 5 | | 15 | |
| 06:30 | | | 0 | | 2 | | 2 | | 18:30 | | | 8 | | 10 | | 18 | |
| 06:45 | | | 0 | | 1 | 7 | 1 | 7 | 18:45 | | | 6 | 33 | 3 | 25 | 9 | 58 |
| 07:00 | | | 2 | | 1 | | 3 | | 19:00 | | | 4 | | 7 | | 11 | |
| 07:15 | | | 1 | | 2 | | 3 | | 19:15 | | | 5 | | 5 | | 10 | |
| 07:30 | | | 1 | | 4 | | 5 | | 19:30 | | | 10 | | 5 | | 15 | |
| 07:45 | | | 4 | 8 | 8 | 15 | 12 | 23 | 19:45 | | | 6 | 25 | 6 | 23 | 12 | 48 |
| 08:00 | | | 3 | | 3 | | 6 | | 20:00 | | | 3 | | 1 | | 4 | |
| 08:15 | | | 3 | | 4 | | 7 | | 20:15 | | | 6 | | 4 | | 10 | |
| 08:30 | | | 1 | | 6 | | 7 | | 20:30 | | | 7 | | 2 | | 9 | |
| 08:45 | | | 4 | 11 | 5 | 18 | 9 | 29 | 20:45 | | | 3 | 19 | 7 | 14 | 10 | 33 |
| 09:00 | | | 2 | | 7 | | 9 | | 21:00 | | | 6 | | 2 | | 8 | |
| 09:15 | | | 8 | | 15 | | 23 | | 21:15 | | | 3 | | 2 | | 5 | |
| 09:30 | | | 5 | | 9 | | 14 | | 21:30 | | | 2 | | 3 | | 5 | |
| 09:45 | | | 3 | 18 | 11 | 42 | 14 | 60 | 21:45 | | | 6 | 17 | 1 | 8 | 7 | 25 |
| 10:00 | | | 6 | | 8 | | 14 | | 22:00 | | | 4 | | 2 | | 6 | |
| 10:15 | | | 5 | | 6 | | 11 | | 22:15 | | | 9 | | 2 | | 11 | |
| 10:30 | | | 6 | | 10 | | 16 | | 22:30 | | | 5 | | 3 | | 8 | |
| 10:45 | | | 6 | 23 | 10 | 34 | 16 | 57 | 22:45 | | | 8 | 26 | 4 | 11 | 12 | 37 |
| 11:00 | | | 8 | | 9 | | 17 | | 23:00 | | | 4 | | 2 | | 6 | |
| 11:15 | | | 4 | | 11 | | 15 | | 23:15 | | | 5 | | 2 | | 7 | |
| 11:30 | | | 9 | | 7 | | 16 | | 23:30 | | | 1 | | 2 | | 3 | |
| 11:45 | | | 6 | 27 | 5 | 32 | 11 | 59 | 23:45 | | | 2 | 12 | 6 | 12 | 8 | 24 |
| TOTALS | | | | 101 | | 155 | | 256 | TOTALS | | | | 337 | | 257 | | 594 |
| SPLIT % | | | | 39.5% | | 60.5% | | 30.1% | SPLIT % | | | | 56.7% | | 43.3% | | 69.9% |

| DAILY TOTALS | NB | SB | EB | WB | Total |
|---|---|---|---|---|---|
| | 0 | 0 | 438 | 412 | 850 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| AM Peak Hour | | | 11:30 | 09:15 | 11:30 | PM Peak Hour | | | 17:30 | 15:00 | 12:00 |
| AM Pk Volume | | | 42 | 43 | 71 | PM Pk Volume | | | 40 | 35 | 70 |
| Pk Hr Factor | | | 0.750 | 0.717 | 0.772 | Pk Hr Factor | | | 0.909 | 0.729 | 0.761 |
| 7 - 9 Volume | 0 | 0 | 19 | 33 | 52 | 4 - 6 Volume | 0 | 0 | 73 | 43 | 116 |
| 7 - 9 Peak Hour | | | 07:30 | 07:45 | 07:45 | 4 - 6 Peak Hour | | | 16:00 | 17:00 | 17:00 |
| 7 - 9 Pk Volume | 0 | 0 | 11 | 21 | 32 | 4 - 6 Pk Volume | 0 | 0 | 37 | 27 | 63 |
| Pk Hr Factor | 0.000 | 0.000 | 0.688 | 0.656 | 0.667 | Pk Hr Factor | 0.000 | 0.000 | 0.925 | 0.750 | 0.829 |

# APPENDIX B: LOS WORKSHEETS

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing No Project AM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 0 | 2 | 105 | 0 | 101 | 24 | 376 | 26 | 98 | 1479 | 20 |
| Future Volume (vph) | 6 | 0 | 2 | 105 | 0 | 101 | 24 | 376 | 26 | 98 | 1479 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 6 | 0 | 2 | 113 | 0 | 109 | 26 | 404 | 28 | 105 | 1590 | 22 |
| RTOR Reduction (vph) | 0 | 1 | 1 | 0 | 96 | 0 | 0 | 0 | 16 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 6 | 0 | 0 | 113 | 13 | 0 | 26 | 404 | 12 | 105 | 1611 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 0.6 | 0.6 | 0.6 | 6.9 | 6.9 | | 1.6 | 24.4 | 24.4 | 6.7 | 29.5 | |
| Effective Green, g (s) | 0.6 | 0.6 | 0.6 | 6.9 | 6.9 | | 1.6 | 24.4 | 24.4 | 6.7 | 29.5 | |
| Actuated g/C Ratio | 0.01 | 0.01 | 0.01 | 0.12 | 0.12 | | 0.03 | 0.43 | 0.43 | 0.12 | 0.52 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 37 | 16 | 16 | 220 | 195 | | 99 | 1543 | 682 | 214 | 2702 | |
| v/s Ratio Prot | 0.00 | 0.00 | | c0.06 | c0.01 | | 0.01 | 0.11 | | c0.06 | c0.31 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.16 | 0.00 | 0.00 | 0.51 | 0.07 | | 0.26 | 0.26 | 0.02 | 0.49 | 0.60 | |
| Uniform Delay, d1 | 27.7 | 27.7 | 27.7 | 23.2 | 22.0 | | 26.9 | 10.3 | 9.2 | 23.3 | 9.4 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.0 | 0.0 | 0.8 | 0.1 | | 0.5 | 0.1 | 0.0 | 0.6 | 0.4 | |
| Delay (s) | 28.5 | 27.7 | 27.7 | 24.1 | 22.0 | | 27.4 | 10.4 | 9.2 | 23.9 | 9.7 | |
| Level of Service | C | C | C | C | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.3 | | | 23.1 | | | 11.3 | | | 10.6 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 56.5 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 56.4% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 385 | 7 | 33 | 1552 | 1 |
| Future Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 385 | 7 | 33 | 1552 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Flt Permitted | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 2 | 27 | 0 | 42 | 27 | 414 | 8 | 35 | 1669 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 2 | 0 | 65 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 4 | 0 | 27 | 414 | 5 | 35 | 1670 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | | | 0.8 | | 3.9 | | 0.9 | 36.4 | 36.4 | 2.6 | 38.1 | |
| Effective Green, g (s) | | | 0.8 | | 3.9 | | 0.9 | 36.4 | 36.4 | 2.6 | 38.1 | |
| Actuated g/C Ratio | | | 0.01 | | 0.06 | | 0.01 | 0.59 | 0.59 | 0.04 | 0.62 | |
| Clearance Time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | | | 20 | | 106 | | 51 | 2105 | 931 | 75 | 3197 | |
| v/s Ratio Prot | | | | | c0.00 | | 0.01 | 0.12 | | c0.02 | c0.32 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.00 | | | |
| v/c Ratio | | | 0.00 | | 0.04 | | 0.53 | 0.20 | 0.01 | 0.47 | 0.52 | |
| Uniform Delay, d1 | | | 30.1 | | 27.2 | | 30.2 | 5.9 | 5.2 | 28.9 | 6.7 | |
| Progression Factor | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.0 | | 0.1 | | 4.5 | 0.0 | 0.0 | 1.7 | 0.2 | |
| Delay (s) | | | 30.1 | | 27.3 | | 34.7 | 5.9 | 5.2 | 30.6 | 6.9 | |
| Level of Service | | | C | | C | | C | A | A | C | A | |
| Approach Delay (s) | | 30.1 | | | 27.3 | | | 7.7 | | | 7.3 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.48 | | |
| Actuated Cycle Length (s) | 61.8 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 397 | 4 | 0 | 1579 | 0 | 20 |
| Future Volume (Veh/h) | 397 | 4 | 0 | 1579 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 427 | 4 | 0 | 1698 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.81 | |
| vC, conflicting volume | | | 431 | | 993 | 214 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 431 | | 193 | 214 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 97 |
| cM capacity (veh/h) | | | 1125 | | 633 | 792 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 214 | 214 | 4 | 0 | 566 | 566 | 566 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 792 |
| Volume to Capacity | 0.13 | 0.13 | 0.00 | 0.00 | 0.33 | 0.33 | 0.33 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| Lane LOS | | | | | | | | A |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 9.7 |
| Approach LOS | | | | | | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 33.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 95 | 174 | 0 | 0 | 1393 | 186 | 17 | 1 | 227 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 95 | 174 | 0 | 0 | 1393 | 186 | 17 | 1 | 227 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 102 | 187 | 0 | 0 | 1498 | 200 | 18 | 1 | 244 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.73 | | | | | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| vC, conflicting volume | 1498 | | | 187 | | | 1140 | 1889 | 187 | 1890 | 1889 | 749 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 941 | | | 187 | | | 450 | 1477 | 187 | 1477 | 1477 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 81 | | | 100 | | | 94 | 99 | 85 | 100 | 100 | 100 |
| cM capacity (veh/h) | 533 | | | 1399 | | | 286 | 75 | 1644 | 47 | 75 | 796 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 102 | 187 | 749 | 749 | 200 | 19 | 244 |
| Volume Left | 102 | 0 | 0 | 0 | 0 | 18 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 200 | 0 | 244 |
| cSH | 533 | 1700 | 1700 | 1700 | 1700 | 249 | 1644 |
| Volume to Capacity | 0.19 | 0.11 | 0.44 | 0.44 | 0.12 | 0.08 | 0.15 |
| Queue Length 95th (ft) | 18 | 0 | 0 | 0 | 0 | 6 | 13 |
| Control Delay (s) | 13.3 | 0.0 | 0.0 | 0.0 | 0.0 | 20.7 | 7.6 |
| Lane LOS | B | | | | | C | A |
| Approach Delay (s) | 4.7 | | 0.0 | | | 8.5 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 57.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 138 | 206 | 415 | 995 | 65 | 124 |
| Future Volume (Veh/h) | 138 | 206 | 415 | 995 | 65 | 124 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 148 | 222 | 446 | 1070 | 70 | 133 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 446 | | | | 964 | 446 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 446 | | | | 964 | 446 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 87 | | | | 71 | 78 |
| cM capacity (veh/h) | 1125 | | | | 239 | 617 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 370 | 446 | 1070 | 70 | 133 |
| Volume Left | 148 | 0 | 0 | 70 | 0 |
| Volume Right | 0 | 0 | 1070 | 0 | 133 |
| cSH | 1125 | 1700 | 1700 | 239 | 617 |
| Volume to Capacity | 0.13 | 0.26 | 0.63 | 0.29 | 0.22 |
| Queue Length 95th (ft) | 11 | 0 | 0 | 29 | 20 |
| Control Delay (s) | 4.3 | 0.0 | 0.0 | 26.2 | 12.4 |
| Lane LOS | A | | | D | B |
| Approach Delay (s) | 4.3 | 0.0 | | 17.2 | |
| Approach LOS | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 86.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 65 | 48 | 1 | 134 | 66 | 2 |
| Future Volume (Veh/h) | 65 | 48 | 1 | 134 | 66 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 70 | 52 | 1 | 144 | 71 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 122 | | 243 | 97 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 122 | | 243 | 97 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 90 | 100 |
| cM capacity (veh/h) | | | 1465 | | 744 | 958 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 122 | 145 | 73 |
| Volume Left | 0 | 1 | 71 |
| Volume Right | 52 | 0 | 2 |
| cSH | 1700 | 1465 | 749 |
| Volume to Capacity | 0.07 | 0.00 | 0.10 |
| Queue Length 95th (ft) | 0 | 0 | 8 |
| Control Delay (s) | 0.0 | 0.1 | 10.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 18.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 39 | 44 | 0 | 32 | 430 |
| Future Volume (Veh/h) | 7 | 39 | 44 | 0 | 32 | 430 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 8 | 42 | 47 | 0 | 34 | 462 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 577 | 47 | | | 47 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 577 | 47 | | | 47 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 98 | |
| cM capacity (veh/h) | 468 | 1022 | | | 1560 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 50 | 47 | 496 |
| Volume Left | 8 | 0 | 34 |
| Volume Right | 42 | 0 | 0 |
| cSH | 859 | 1700 | 1560 |
| Volume to Capacity | 0.06 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 2 |
| Control Delay (s) | 9.4 | 0.0 | 0.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.4 | 0.0 | 0.7 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.4 | | |
| Intersection Capacity Utilization | 41.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 12 | 11 | 3 | 9 | 11 | 8 |
| Future Volume (Veh/h) | 12 | 11 | 3 | 9 | 11 | 8 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 13 | 12 | 3 | 10 | 12 | 9 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 42 | 8 | | | 13 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 42 | 8 | | | 13 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 99 | | | 99 | |
| cM capacity (veh/h) | 961 | 1074 | | | 1606 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 25 | 13 | 21 |
| Volume Left | 13 | 0 | 12 |
| Volume Right | 12 | 10 | 0 |
| cSH | 1012 | 1700 | 1606 |
| Volume to Capacity | 0.02 | 0.01 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 8.6 | 0.0 | 4.2 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 4.2 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.1 | | |
| Intersection Capacity Utilization | 17.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing No Project PM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 27 | 51 | 0 | 73 | 3 | 1191 | 57 | 67 | 491 | 13 |
| Future Volume (vph) | 20 | 0 | 27 | 51 | 0 | 73 | 3 | 1191 | 57 | 67 | 491 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 21 | 0 | 28 | 54 | 0 | 77 | 3 | 1254 | 60 | 71 | 517 | 14 |
| RTOR Reduction (vph) | 0 | 13 | 13 | 0 | 68 | 0 | 0 | 0 | 27 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 21 | 1 | 1 | 54 | 9 | 0 | 3 | 1254 | 33 | 71 | 530 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 1.8 | 6.2 | 6.2 | 4.4 | 8.8 | | 0.6 | 43.5 | 43.5 | 6.3 | 49.2 | |
| Effective Green, g (s) | 1.8 | 6.2 | 6.2 | 4.4 | 8.8 | | 0.6 | 43.5 | 43.5 | 6.3 | 49.2 | |
| Actuated g/C Ratio | 0.02 | 0.08 | 0.08 | 0.06 | 0.11 | | 0.01 | 0.56 | 0.56 | 0.08 | 0.63 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 80 | 121 | 121 | 101 | 181 | | 26 | 2005 | 875 | 145 | 3214 | |
| v/s Ratio Prot | 0.01 | 0.00 | | c0.03 | c0.01 | | 0.00 | c0.35 | | c0.04 | 0.10 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.26 | 0.01 | 0.01 | 0.53 | 0.05 | | 0.12 | 0.63 | 0.04 | 0.49 | 0.16 | |
| Uniform Delay, d1 | 37.6 | 33.2 | 33.2 | 36.0 | 31.0 | | 38.6 | 11.9 | 7.9 | 34.5 | 6.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.0 | 0.0 | 2.7 | 0.0 | | 0.7 | 0.6 | 0.0 | 0.9 | 0.0 | |
| Delay (s) | 38.2 | 33.2 | 33.2 | 38.7 | 31.1 | | 39.3 | 12.5 | 7.9 | 35.4 | 6.1 | |
| Level of Service | D | C | C | D | C | | D | B | A | D | A | |
| Approach Delay (s) | | 35.4 | | | 34.2 | | | 12.3 | | | 9.5 | |
| Approach LOS | | D | | | C | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.4 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.54 | | |
| Actuated Cycle Length (s) | 78.3 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 58.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1198 | 29 | 34 | 533 | 2 |
| Future Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1198 | 29 | 34 | 533 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 2 | 0 | 48 | 21 | 0 | 33 | 3 | 1261 | 31 | 36 | 561 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 46 | 0 | 52 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1261 | 19 | 36 | 563 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.7 | 38.7 | 2.3 | 40.2 | |
| Effective Green, g (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.7 | 38.7 | 2.3 | 40.2 | |
| Actuated g/C Ratio | 0.04 | | 0.04 | | 0.04 | | 0.01 | 0.60 | 0.60 | 0.04 | 0.63 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 72 | | 65 | | 69 | | 43 | 2172 | 950 | 64 | 3209 | |
| v/s Ratio Prot | 0.00 | | | | c0.00 | | 0.00 | c0.35 | | c0.02 | 0.11 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.03 | | 0.03 | | 0.03 | | 0.07 | 0.58 | 0.02 | 0.56 | 0.18 | |
| Uniform Delay, d1 | 29.6 | | 29.6 | | 29.6 | | 31.4 | 7.8 | 5.2 | 30.5 | 5.1 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | | 0.1 | | 0.1 | | 0.3 | 0.4 | 0.0 | 6.6 | 0.0 | |
| Delay (s) | 29.7 | | 29.7 | | 29.7 | | 31.6 | 8.2 | 5.2 | 37.1 | 5.1 | |
| Level of Service | C | | C | | C | | C | A | A | D | A | |
| Approach Delay (s) | | 29.7 | | | 29.7 | | | 8.2 | | | 7.0 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 64.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1215 | 11 | 24 | 575 | 0 | 15 |
| Future Volume (Veh/h) | 1215 | 11 | 24 | 575 | 0 | 15 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1279 | 12 | 25 | 605 | 0 | 16 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.99 | |
| vC, conflicting volume | | | 1291 | | 1531 | 640 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1291 | | 1505 | 640 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 100 | 96 |
| cM capacity (veh/h) | | | 533 | | 106 | 418 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 640 | 640 | 12 | 25 | 202 | 202 | 202 | 16 |
| Volume Left | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 16 |
| cSH | 1700 | 1700 | 1700 | 533 | 1700 | 1700 | 1700 | 418 |
| Volume to Capacity | 0.38 | 0.38 | 0.01 | 0.05 | 0.12 | 0.12 | 0.12 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 12.1 | 0.0 | 0.0 | 0.0 | 13.9 |
| Lane LOS | | | | B | | | | B |
| Approach Delay (s) | 0.0 | | | 0.5 | | | | 13.9 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 284 | 562 | 0 | 0 | 370 | 205 | 19 | 2 | 664 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 284 | 562 | 0 | 0 | 370 | 205 | 19 | 2 | 664 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 299 | 592 | 0 | 0 | 389 | 216 | 20 | 2 | 699 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 389 | | | 592 | | | 1384 | 1579 | 592 | 1580 | 1579 | 194 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 389 | | | 592 | | | 1384 | 1579 | 592 | 1580 | 1579 | 194 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 75 | | | 100 | | | 76 | 98 | 58 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1181 | | | 994 | | | 84 | 82 | 1654 | 34 | 82 | 820 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 299 | 592 | 194 | 194 | 216 | 22 | 699 |
| Volume Left | 299 | 0 | 0 | 0 | 0 | 20 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 216 | 0 | 699 |
| cSH | 1181 | 1700 | 1700 | 1700 | 1700 | 84 | 1654 |
| Volume to Capacity | 0.25 | 0.35 | 0.11 | 0.11 | 0.13 | 0.26 | 0.42 |
| Queue Length 95th (ft) | 25 | 0 | 0 | 0 | 0 | 24 | 54 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 62.4 | 8.8 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.0 | | 0.0 | | | 10.4 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 77.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 18 | 658 | 177 | 212 | 188 | 130 |
| Future Volume (Veh/h) | 18 | 658 | 177 | 212 | 188 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 19 | 693 | 186 | 223 | 198 | 137 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 186 | | | | 917 | 186 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 186 | | | | 917 | 186 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 34 | 84 |
| cM capacity (veh/h) | 1401 | | | | 299 | 861 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 712 | 186 | 223 | 198 | 137 |
| Volume Left | 19 | 0 | 0 | 198 | 0 |
| Volume Right | 0 | 0 | 223 | 0 | 137 |
| cSH | 1401 | 1700 | 1700 | 299 | 861 |
| Volume to Capacity | 0.01 | 0.11 | 0.13 | 0.66 | 0.16 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 109 | 14 |
| Control Delay (s) | 0.4 | 0.0 | 0.0 | 37.8 | 10.0 |
| Lane LOS | A | | | E | A |
| Approach Delay (s) | 0.4 | 0.0 | | 26.4 | |
| Approach LOS | | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.3 | | |
| Intersection Capacity Utilization | 65.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 73 | 46 | 1 | 61 | 55 | 0 |
| Future Volume (Veh/h) | 73 | 46 | 1 | 61 | 55 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 77 | 48 | 1 | 64 | 58 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 125 | | 167 | 101 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 125 | | 167 | 101 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 93 | 100 |
| cM capacity (veh/h) | | | 1462 | | 823 | 954 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 125 | 65 | 58 |
| Volume Left | 0 | 1 | 58 |
| Volume Right | 48 | 0 | 0 |
| cSH | 1700 | 1462 | 823 |
| Volume to Capacity | 0.07 | 0.00 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 6 |
| Control Delay (s) | 0.0 | 0.1 | 9.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.1 | 9.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 16.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 23 | 108 | 3 | 37 | 129 |
| Future Volume (Veh/h) | 1 | 23 | 108 | 3 | 37 | 129 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1 | 24 | 114 | 3 | 39 | 136 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 330 | 116 | | | 117 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 330 | 116 | | | 117 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 97 | |
| cM capacity (veh/h) | 647 | 937 | | | 1471 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 25 | 117 | 175 |
| Volume Left | 1 | 0 | 39 |
| Volume Right | 24 | 3 | 0 |
| cSH | 920 | 1700 | 1471 |
| Volume to Capacity | 0.03 | 0.07 | 0.03 |
| Queue Length 95th (ft) | 2 | 0 | 2 |
| Control Delay (s) | 9.0 | 0.0 | 1.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 1.8 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 25.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 24 | 7 | 21 | 8 | 5 |
| Future Volume (Veh/h) | 8 | 24 | 7 | 21 | 8 | 5 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 25 | 7 | 22 | 8 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 39 | 18 | | | 29 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 39 | 18 | | | 29 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 98 | | | 99 | |
| cM capacity (veh/h) | 968 | 1061 | | | 1584 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 33 | 29 | 13 |
| Volume Left | 8 | 0 | 8 |
| Volume Right | 25 | 22 | 0 |
| cSH | 1036 | 1700 | 1584 |
| Volume to Capacity | 0.03 | 0.02 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 4.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 4.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 17.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 0 | 2 | 112 | 0 | 111 | 24 | 377 | 27 | 101 | 1479 | 20 |
| Future Volume (vph) | 6 | 0 | 2 | 112 | 0 | 111 | 24 | 377 | 27 | 101 | 1479 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 6 | 0 | 2 | 120 | 0 | 119 | 26 | 405 | 29 | 109 | 1590 | 22 |
| RTOR Reduction (vph) | 0 | 1 | 1 | 0 | 104 | 0 | 0 | 0 | 17 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 6 | 0 | 0 | 120 | 15 | 0 | 26 | 405 | 12 | 109 | 1611 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 0.6 | 0.6 | 0.6 | 7.1 | 7.1 | | 1.6 | 24.0 | 24.0 | 6.8 | 29.2 | |
| Effective Green, g (s) | 0.6 | 0.6 | 0.6 | 7.1 | 7.1 | | 1.6 | 24.0 | 24.0 | 6.8 | 29.2 | |
| Actuated g/C Ratio | 0.01 | 0.01 | 0.01 | 0.13 | 0.13 | | 0.03 | 0.43 | 0.43 | 0.12 | 0.52 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 37 | 16 | 16 | 227 | 201 | | 99 | 1520 | 672 | 217 | 2679 | |
| v/s Ratio Prot | 0.00 | 0.00 | | c0.07 | c0.01 | | 0.01 | 0.11 | | c0.06 | c0.31 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.16 | 0.00 | 0.00 | 0.53 | 0.07 | | 0.26 | 0.27 | 0.02 | 0.50 | 0.60 | |
| Uniform Delay, d1 | 27.7 | 27.6 | 27.6 | 23.1 | 21.8 | | 26.8 | 10.5 | 9.4 | 23.2 | 9.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.0 | 0.0 | 1.0 | 0.1 | | 0.5 | 0.1 | 0.0 | 0.7 | 0.4 | |
| Delay (s) | 28.4 | 27.6 | 27.6 | 24.1 | 21.8 | | 27.3 | 10.6 | 9.4 | 23.9 | 9.9 | |
| Level of Service | C | C | C | C | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.2 | | | 23.0 | | | 11.5 | | | 10.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.2 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 56.4 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 56.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 2 | 25 | 0 | 40 | 25 | 386 | 7 | 33 | 1559 | 1 |
| Future Volume (vph) | 0 | 0 | 2 | 25 | 0 | 40 | 25 | 386 | 7 | 33 | 1559 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 1615 | | 1693 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Flt Permitted | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 1615 | | 1693 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 2 | 27 | 0 | 43 | 27 | 415 | 8 | 35 | 1676 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 2 | 0 | 65 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 5 | 0 | 27 | 415 | 5 | 35 | 1677 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | | | 0.8 | | 4.0 | | 0.9 | 36.6 | 36.6 | 2.6 | 38.3 | |
| Effective Green, g (s) | | | 0.8 | | 4.0 | | 0.9 | 36.6 | 36.6 | 2.6 | 38.3 | |
| Actuated g/C Ratio | | | 0.01 | | 0.06 | | 0.01 | 0.59 | 0.59 | 0.04 | 0.62 | |
| Clearance Time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | | | 20 | | 109 | | 50 | 2106 | 932 | 75 | 3198 | |
| v/s Ratio Prot | | | | | c0.00 | | 0.01 | 0.12 | | c0.02 | c0.32 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.00 | | | |
| v/c Ratio | | | 0.00 | | 0.04 | | 0.54 | 0.20 | 0.01 | 0.47 | 0.52 | |
| Uniform Delay, d1 | | | 30.3 | | 27.3 | | 30.4 | 5.9 | 5.3 | 29.1 | 6.7 | |
| Progression Factor | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.0 | | 0.1 | | 6.2 | 0.0 | 0.0 | 1.7 | 0.2 | |
| Delay (s) | | | 30.3 | | 27.3 | | 36.6 | 6.0 | 5.3 | 30.7 | 6.9 | |
| Level of Service | | | C | | C | | D | A | A | C | A | |
| Approach Delay (s) | | 30.3 | | | 27.3 | | | 7.8 | | | 7.4 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 62.1 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 398 | 5 | 0 | 1586 | 0 | 20 |
| Future Volume (Veh/h) | 398 | 5 | 0 | 1586 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 428 | 5 | 0 | 1705 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.81 | |
| vC, conflicting volume | | | 433 | | 999 | 145 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 433 | | 194 | 145 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 97 |
| cM capacity (veh/h) | | | 1123 | | 632 | 876 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 171 | 171 | 91 | 0 | 568 | 568 | 568 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 876 |
| Volume to Capacity | 0.10 | 0.10 | 0.05 | 0.00 | 0.33 | 0.33 | 0.33 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.2 |
| Lane LOS | | | | | | | | A |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 9.2 |
| Approach LOS | | | | | | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 34.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 100 | 175 | 0 | 0 | 1396 | 191 | 17 | 1 | 229 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 100 | 175 | 0 | 0 | 1396 | 191 | 17 | 1 | 229 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 108 | 188 | 0 | 0 | 1501 | 205 | 18 | 1 | 246 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.73 | | | | | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| vC, conflicting volume | 1501 | | | 188 | | | 1154 | 1905 | 188 | 1906 | 1905 | 750 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 943 | | | 188 | | | 467 | 1497 | 188 | 1498 | 1497 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 80 | | | 100 | | | 93 | 99 | 85 | 100 | 100 | 100 |
| cM capacity (veh/h) | 532 | | | 1398 | | | 274 | 72 | 1644 | 45 | 72 | 795 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 108 | 188 | 750 | 750 | 205 | 19 | 246 |
| Volume Left | 108 | 0 | 0 | 0 | 0 | 18 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 205 | 0 | 246 |
| cSH | 532 | 1700 | 1700 | 1700 | 1700 | 239 | 1644 |
| Volume to Capacity | 0.20 | 0.11 | 0.44 | 0.44 | 0.12 | 0.08 | 0.15 |
| Queue Length 95th (ft) | 19 | 0 | 0 | 0 | 0 | 6 | 13 |
| Control Delay (s) | 13.5 | 0.0 | 0.0 | 0.0 | 0.0 | 21.4 | 7.6 |
| Lane LOS | B | | | | | C | A |
| Approach Delay (s) | 4.9 | | 0.0 | | | 8.6 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 57.5% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 141 | 211 | 415 | 998 | 66 | 125 |
| Future Volume (Veh/h) | 141 | 211 | 415 | 998 | 66 | 125 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 152 | 227 | 446 | 1073 | 71 | 134 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 446 | | | | 977 | 446 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 446 | | | | 977 | 446 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 86 | | | | 70 | 78 |
| cM capacity (veh/h) | 1125 | | | | 234 | 617 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 379 | 446 | 1073 | 71 | 134 |
| Volume Left | 152 | 0 | 0 | 71 | 0 |
| Volume Right | 0 | 0 | 1073 | 0 | 134 |
| cSH | 1125 | 1700 | 1700 | 234 | 617 |
| Volume to Capacity | 0.14 | 0.26 | 0.63 | 0.30 | 0.22 |
| Queue Length 95th (ft) | 12 | 0 | 0 | 31 | 21 |
| Control Delay (s) | 4.3 | 0.0 | 0.0 | 27.0 | 12.5 |
| Lane LOS | A | | | D | B |
| Approach Delay (s) | 4.3 | 0.0 | | 17.5 | |
| Approach LOS | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.5 | | |
| Intersection Capacity Utilization | 87.4% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 65 | 52 | 1 | 134 | 83 | 2 |
| Future Volume (Veh/h) | 65 | 52 | 1 | 134 | 83 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 70 | 56 | 1 | 144 | 89 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 126 | | 245 | 99 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 126 | | 245 | 99 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 88 | 100 |
| cM capacity (veh/h) | | | 1460 | | 742 | 956 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 126 | 145 | 91 |
| Volume Left | 0 | 1 | 89 |
| Volume Right | 56 | 0 | 2 |
| cSH | 1700 | 1460 | 746 |
| Volume to Capacity | 0.07 | 0.00 | 0.12 |
| Queue Length 95th (ft) | 0 | 0 | 10 |
| Control Delay (s) | 0.0 | 0.1 | 10.5 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.5 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.7 | | |
| Intersection Capacity Utilization | 19.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 47 | 44 | 0 | 34 | 430 |
| Future Volume (Veh/h) | 7 | 47 | 44 | 0 | 34 | 430 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 8 | 51 | 47 | 0 | 37 | 462 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 583 | 47 | | | 47 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 583 | 47 | | | 47 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 95 | | | 98 | |
| cM capacity (veh/h) | 463 | 1022 | | | 1560 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 59 | 47 | 499 |
| Volume Left | 8 | 0 | 37 |
| Volume Right | 51 | 0 | 0 |
| cSH | 879 | 1700 | 1560 |
| Volume to Capacity | 0.07 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 2 |
| Control Delay (s) | 9.4 | 0.0 | 0.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.4 | 0.0 | 0.8 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 41.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 14 | 2 | 2 | 27 |
| Future Volume (Veh/h) | 2 | 2 | 14 | 2 | 2 | 27 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 15 | 2 | 2 | 29 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 50 | 16 | | | 17 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 50 | 16 | | | 17 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 957 | 1063 | | | 1600 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 17 | 31 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1007 | 1700 | 1600 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 0.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 0.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing Plus Project PM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 27 | 55 | 0 | 80 | 3 | 1192 | 62 | 79 | 491 | 13 |
| Future Volume (vph) | 20 | 0 | 27 | 55 | 0 | 80 | 3 | 1192 | 62 | 79 | 491 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 21 | 0 | 28 | 58 | 0 | 84 | 3 | 1255 | 65 | 83 | 517 | 14 |
| RTOR Reduction (vph) | 0 | 13 | 13 | 0 | 75 | 0 | 0 | 0 | 29 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 21 | 1 | 1 | 58 | 9 | 0 | 3 | 1255 | 36 | 83 | 530 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 1.8 | 6.2 | 6.2 | 4.5 | 8.9 | | 0.6 | 43.5 | 43.5 | 6.8 | 49.7 | |
| Effective Green, g (s) | 1.8 | 6.2 | 6.2 | 4.5 | 8.9 | | 0.6 | 43.5 | 43.5 | 6.8 | 49.7 | |
| Actuated g/C Ratio | 0.02 | 0.08 | 0.08 | 0.06 | 0.11 | | 0.01 | 0.55 | 0.55 | 0.09 | 0.63 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 79 | 120 | 120 | 102 | 182 | | 26 | 1990 | 868 | 155 | 3221 | |
| v/s Ratio Prot | 0.01 | 0.00 | | c0.03 | c0.01 | | 0.00 | c0.35 | | c0.05 | 0.10 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.27 | 0.01 | 0.01 | 0.57 | 0.05 | | 0.12 | 0.63 | 0.04 | 0.54 | 0.16 | |
| Uniform Delay, d1 | 37.9 | 33.5 | 33.5 | 36.3 | 31.2 | | 38.9 | 12.2 | 8.1 | 34.5 | 6.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.7 | 0.0 | 0.0 | 4.3 | 0.0 | | 0.7 | 0.7 | 0.0 | 1.8 | 0.0 | |
| Delay (s) | 38.6 | 33.5 | 33.5 | 40.5 | 31.3 | | 39.6 | 12.8 | 8.1 | 36.3 | 6.1 | |
| Level of Service | D | C | C | D | C | | D | B | A | D | A | |
| Approach Delay (s) | | 35.7 | | | 35.1 | | | 12.7 | | | 10.1 | |
| Approach LOS | | D | | | D | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 14.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 78.9 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 58.6% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 0 | 46 | 20 | 0 | 32 | 3 | 1203 | 29 | 34 | 537 | 2 |
| Future Volume (vph) | 2 | 0 | 46 | 20 | 0 | 32 | 3 | 1203 | 29 | 34 | 537 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1709 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1709 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 2 | 0 | 48 | 21 | 0 | 34 | 3 | 1266 | 31 | 36 | 565 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 46 | 0 | 53 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1266 | 19 | 36 | 567 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.9 | 38.9 | 2.3 | 40.4 | |
| Effective Green, g (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.9 | 38.9 | 2.3 | 40.4 | |
| Actuated g/C Ratio | 0.04 | | 0.04 | | 0.04 | | 0.01 | 0.60 | 0.60 | 0.04 | 0.63 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 72 | | 65 | | 68 | | 43 | 2177 | 952 | 64 | 3215 | |
| v/s Ratio Prot | 0.00 | | | | c0.00 | | 0.00 | c0.35 | | c0.02 | 0.11 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.03 | | 0.03 | | 0.03 | | 0.07 | 0.58 | 0.02 | 0.56 | 0.18 | |
| Uniform Delay, d1 | 29.7 | | 29.7 | | 29.7 | | 31.5 | 7.8 | 5.1 | 30.6 | 5.1 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | | 0.1 | | 0.1 | | 0.3 | 0.4 | 0.0 | 6.6 | 0.0 | |
| Delay (s) | 29.8 | | 29.8 | | 29.8 | | 31.7 | 8.2 | 5.1 | 37.2 | 5.1 | |
| Level of Service | C | | C | | C | | C | A | A | D | A | |
| Approach Delay (s) | | 29.8 | | | 29.8 | | | 8.2 | | | 7.0 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 64.5 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1220 | 14 | 24 | 579 | 0 | 15 |
| Future Volume (Veh/h) | 1220 | 14 | 24 | 579 | 0 | 15 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1284 | 15 | 25 | 609 | 0 | 16 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.99 | |
| vC, conflicting volume | | | 1299 | | 1537 | 642 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1299 | | 1510 | 642 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 100 | 96 |
| cM capacity (veh/h) | | | 529 | | 105 | 417 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 642 | 642 | 15 | 25 | 203 | 203 | 203 | 16 |
| Volume Left | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 16 |
| cSH | 1700 | 1700 | 1700 | 529 | 1700 | 1700 | 1700 | 417 |
| Volume to Capacity | 0.38 | 0.38 | 0.01 | 0.05 | 0.12 | 0.12 | 0.12 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 12.1 | 0.0 | 0.0 | 0.0 | 14.0 |
| Lane LOS | | | | B | | | | B |
| Approach Delay (s) | 0.0 | | | 0.5 | | | | 14.0 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 287 | 566 | 0 | 0 | 372 | 208 | 20 | 2 | 669 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 287 | 566 | 0 | 0 | 372 | 208 | 20 | 2 | 669 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 302 | 596 | 0 | 0 | 392 | 219 | 21 | 2 | 704 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 392 | | | 596 | | | 1396 | 1592 | 596 | 1593 | 1592 | 196 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 392 | | | 596 | | | 1396 | 1592 | 596 | 1593 | 1592 | 196 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 74 | | | 100 | | | 74 | 98 | 57 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1178 | | | 990 | | | 82 | 81 | 1655 | 33 | 81 | 819 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 302 | 596 | 196 | 196 | 219 | 23 | 704 |
| Volume Left | 302 | 0 | 0 | 0 | 0 | 21 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 219 | 0 | 704 |
| cSH | 1178 | 1700 | 1700 | 1700 | 1700 | 82 | 1655 |
| Volume to Capacity | 0.26 | 0.35 | 0.12 | 0.12 | 0.13 | 0.28 | 0.43 |
| Queue Length 95th (ft) | 26 | 0 | 0 | 0 | 0 | 26 | 55 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 65.1 | 8.8 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.1 | | 0.0 | | | 10.6 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.7 | | |
| Intersection Capacity Utilization | 77.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 661 | 178 | 214 | 192 | 135 |
| Future Volume (Veh/h) | 20 | 661 | 178 | 214 | 192 | 135 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 21 | 696 | 187 | 225 | 202 | 142 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 187 | | | | 925 | 187 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 187 | | | | 925 | 187 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 32 | 83 |
| cM capacity (veh/h) | 1399 | | | | 295 | 860 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 717 | 187 | 225 | 202 | 142 |
| Volume Left | 21 | 0 | 0 | 202 | 0 |
| Volume Right | 0 | 0 | 225 | 0 | 142 |
| cSH | 1399 | 1700 | 1700 | 295 | 860 |
| Volume to Capacity | 0.02 | 0.11 | 0.13 | 0.68 | 0.17 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 116 | 15 |
| Control Delay (s) | 0.4 | 0.0 | 0.0 | 39.9 | 10.0 |
| Lane LOS | A | | | E | B |
| Approach Delay (s) | 0.4 | 0.0 | | 27.6 | |
| Approach LOS | | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.6 | | |
| Intersection Capacity Utilization | 65.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 73 | 63 | 1 | 61 | 66 | 0 |
| Future Volume (Veh/h) | 73 | 63 | 1 | 61 | 66 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 77 | 66 | 1 | 64 | 69 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 143 | | 176 | 110 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 143 | | 176 | 110 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 92 | 100 |
| cM capacity (veh/h) | | | 1440 | | 813 | 943 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 143 | 65 | 69 |
| Volume Left | 0 | 1 | 69 |
| Volume Right | 66 | 0 | 0 |
| cSH | 1700 | 1440 | 813 |
| Volume to Capacity | 0.08 | 0.00 | 0.08 |
| Queue Length 95th (ft) | 0 | 0 | 7 |
| Control Delay (s) | 0.0 | 0.1 | 9.8 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.1 | 9.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.5 | | |
| Intersection Capacity Utilization | 18.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 28 | 108 | 3 | 45 | 129 |
| Future Volume (Veh/h) | 1 | 28 | 108 | 3 | 45 | 129 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1 | 29 | 114 | 3 | 47 | 136 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 346 | 116 | | | 117 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 346 | 116 | | | 117 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 97 | |
| cM capacity (veh/h) | 630 | 937 | | | 1471 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 30 | 117 | 183 |
| Volume Left | 1 | 0 | 47 |
| Volume Right | 29 | 3 | 0 |
| cSH | 922 | 1700 | 1471 |
| Volume to Capacity | 0.03 | 0.07 | 0.03 |
| Queue Length 95th (ft) | 3 | 0 | 2 |
| Control Delay (s) | 9.0 | 0.0 | 2.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 2.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 25.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 37 | 2 | 2 | 17 |
| Future Volume (Veh/h) | 2 | 2 | 37 | 2 | 2 | 17 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 39 | 2 | 2 | 18 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 62 | 40 | | | 41 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 62 | 40 | | | 41 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 943 | 1031 | | | 1568 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 41 | 20 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 985 | 1700 | 1568 |
| Volume to Capacity | 0.00 | 0.02 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.7 | 0.0 | 0.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.7 | 0.0 | 0.7 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.8 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing AM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 0 | 2 | 115 | 0 | 101 | 24 | 376 | 34 | 98 | 1479 | 20 |
| Future Volume (vph) | 6 | 0 | 2 | 115 | 0 | 101 | 24 | 376 | 34 | 98 | 1479 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 6 | 0 | 2 | 124 | 0 | 109 | 26 | 404 | 37 | 105 | 1590 | 22 |
| RTOR Reduction (vph) | 0 | 1 | 1 | 0 | 95 | 0 | 0 | 0 | 21 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 6 | 0 | 0 | 124 | 14 | 0 | 26 | 404 | 16 | 105 | 1611 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 0.6 | 0.6 | 0.6 | 7.2 | 7.2 | | 1.6 | 24.4 | 24.4 | 6.7 | 29.5 | |
| Effective Green, g (s) | 0.6 | 0.6 | 0.6 | 7.2 | 7.2 | | 1.6 | 24.4 | 24.4 | 6.7 | 29.5 | |
| Actuated g/C Ratio | 0.01 | 0.01 | 0.01 | 0.13 | 0.13 | | 0.03 | 0.43 | 0.43 | 0.12 | 0.52 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 36 | 16 | 16 | 228 | 202 | | 98 | 1535 | 679 | 212 | 2688 | |
| v/s Ratio Prot | 0.00 | 0.00 | | c0.07 | c0.01 | | 0.01 | 0.11 | | c0.06 | c0.31 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.17 | 0.00 | 0.00 | 0.54 | 0.07 | | 0.27 | 0.26 | 0.02 | 0.50 | 0.60 | |
| Uniform Delay, d1 | 27.9 | 27.8 | 27.8 | 23.3 | 21.8 | | 27.0 | 10.4 | 9.3 | 23.5 | 9.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.8 | 0.0 | 0.0 | 1.4 | 0.1 | | 0.5 | 0.1 | 0.0 | 0.7 | 0.4 | |
| Delay (s) | 28.7 | 27.8 | 27.8 | 24.7 | 21.9 | | 27.6 | 10.5 | 9.3 | 24.1 | 9.9 | |
| Level of Service | C | C | C | C | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.4 | | | 23.4 | | | 11.4 | | | 10.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 56.8 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 57.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 393 | 7 | 33 | 1562 | 1 |
| Future Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 393 | 7 | 33 | 1562 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Flt Permitted | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5186 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 2 | 27 | 0 | 42 | 27 | 423 | 8 | 35 | 1680 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 2 | 0 | 65 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 4 | 0 | 27 | 423 | 5 | 35 | 1681 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | | | 0.8 | | 4.0 | | 0.9 | 36.8 | 36.8 | 2.6 | 38.5 | |
| Effective Green, g (s) | | | 0.8 | | 4.0 | | 0.9 | 36.8 | 36.8 | 2.6 | 38.5 | |
| Actuated g/C Ratio | | | 0.01 | | 0.06 | | 0.01 | 0.59 | 0.59 | 0.04 | 0.62 | |
| Clearance Time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | | | 20 | | 108 | | 50 | 2111 | 934 | 75 | 3204 | |
| v/s Ratio Prot | | | | | c0.00 | | 0.01 | 0.12 | | c0.02 | c0.32 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.00 | | | |
| v/c Ratio | | | 0.00 | | 0.04 | | 0.54 | 0.20 | 0.01 | 0.47 | 0.52 | |
| Uniform Delay, d1 | | | 30.4 | | 27.4 | | 30.5 | 5.9 | 5.2 | 29.2 | 6.7 | |
| Progression Factor | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.0 | | 0.1 | | 6.2 | 0.0 | 0.0 | 1.7 | 0.2 | |
| Delay (s) | | | 30.4 | | 27.4 | | 36.7 | 6.0 | 5.2 | 30.8 | 6.9 | |
| Level of Service | | | C | | C | | D | A | A | C | A | |
| Approach Delay (s) | | 30.4 | | | 27.4 | | | 7.8 | | | 7.4 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 62.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 405 | 4 | 0 | 1589 | 0 | 20 |
| Future Volume (Veh/h) | 405 | 4 | 0 | 1589 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 435 | 4 | 0 | 1709 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.81 | |
| vC, conflicting volume | | | 439 | | 1005 | 218 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 439 | | 200 | 218 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 97 |
| cM capacity (veh/h) | | | 1117 | | 626 | 787 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 218 | 218 | 4 | 0 | 570 | 570 | 570 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 787 |
| Volume to Capacity | 0.13 | 0.13 | 0.00 | 0.00 | 0.34 | 0.34 | 0.34 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.7 |
| Lane LOS | | | | | | | | A |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 9.7 |
| Approach LOS | | | | | | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 34.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 90 | 178 | 0 | 0 | 1398 | 191 | 13 | 1 | 231 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 90 | 178 | 0 | 0 | 1398 | 191 | 13 | 1 | 231 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 97 | 191 | 0 | 0 | 1503 | 205 | 14 | 1 | 248 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.73 | | | | | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| vC, conflicting volume | 1503 | | | 191 | | | 1136 | 1888 | 191 | 1888 | 1888 | 752 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 945 | | | 191 | | | 441 | 1473 | 191 | 1474 | 1473 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 82 | | | 100 | | | 95 | 99 | 85 | 100 | 100 | 100 |
| cM capacity (veh/h) | 530 | | | 1395 | | | 292 | 76 | 1644 | 47 | 76 | 795 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 97 | 191 | 752 | 752 | 205 | 15 | 248 |
| Volume Left | 97 | 0 | 0 | 0 | 0 | 14 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 205 | 0 | 248 |
| cSH | 530 | 1700 | 1700 | 1700 | 1700 | 245 | 1644 |
| Volume to Capacity | 0.18 | 0.11 | 0.44 | 0.44 | 0.12 | 0.06 | 0.15 |
| Queue Length 95th (ft) | 17 | 0 | 0 | 0 | 0 | 5 | 13 |
| Control Delay (s) | 13.3 | 0.0 | 0.0 | 0.0 | 0.0 | 20.6 | 7.6 |
| Lane LOS | B | | | | | C | A |
| Approach Delay (s) | 4.5 | | 0.0 | | | 8.3 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 57.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 133 | 206 | 411 | 1000 | 69 | 120 |
| Future Volume (Veh/h) | 133 | 206 | 411 | 1000 | 69 | 120 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 143 | 222 | 442 | 1075 | 74 | 129 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 442 | | | | 950 | 442 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 442 | | | | 950 | 442 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 87 | | | | 70 | 79 |
| cM capacity (veh/h) | 1129 | | | | 245 | 620 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 365 | 442 | 1075 | 74 | 129 |
| Volume Left | 143 | 0 | 0 | 74 | 0 |
| Volume Right | 0 | 0 | 1075 | 0 | 129 |
| cSH | 1129 | 1700 | 1700 | 245 | 620 |
| Volume to Capacity | 0.13 | 0.26 | 0.63 | 0.30 | 0.21 |
| Queue Length 95th (ft) | 11 | 0 | 0 | 31 | 19 |
| Control Delay (s) | 4.2 | 0.0 | 0.0 | 26.0 | 12.3 |
| Lane LOS | A | | | D | B |
| Approach Delay (s) | 4.2 | 0.0 | | 17.3 | |
| Approach LOS | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 86.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 83 | 38 | 1 | 154 | 56 | 2 |
| Future Volume (Veh/h) | 83 | 38 | 1 | 154 | 56 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 89 | 41 | 1 | 166 | 60 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 130 | | 278 | 110 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 130 | | 278 | 110 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 92 | 100 |
| cM capacity (veh/h) | | | 1455 | | 710 | 942 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 130 | 167 | 62 |
| Volume Left | 0 | 1 | 60 |
| Volume Right | 41 | 0 | 2 |
| cSH | 1700 | 1455 | 716 |
| Volume to Capacity | 0.08 | 0.00 | 0.09 |
| Queue Length 95th (ft) | 0 | 0 | 7 |
| Control Delay (s) | 0.0 | 0.1 | 10.5 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.5 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.8 | | |
| Intersection Capacity Utilization | 19.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 29 | 44 | 0 | 24 | 430 |
| Future Volume (Veh/h) | 7 | 29 | 44 | 0 | 24 | 430 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 8 | 31 | 47 | 0 | 26 | 462 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 561 | 47 | | | 47 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 561 | 47 | | | 47 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 97 | | | 98 | |
| cM capacity (veh/h) | 481 | 1022 | | | 1560 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 39 | 47 | 488 |
| Volume Left | 8 | 0 | 26 |
| Volume Right | 31 | 0 | 0 |
| cSH | 830 | 1700 | 1560 |
| Volume to Capacity | 0.05 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 4 | 0 | 1 |
| Control Delay (s) | 9.5 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.5 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 40.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 3 | 1 | 1 | 8 |
| Future Volume (Veh/h) | 2 | 1 | 3 | 1 | 1 | 8 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 1 | 3 | 1 | 1 | 9 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 16 | 4 | | | 4 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 16 | 4 | | | 4 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 1001 | 1080 | | | 1618 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 3 | 4 | 10 |
| Volume Left | 2 | 0 | 1 |
| Volume Right | 1 | 1 | 0 |
| cSH | 1026 | 1700 | 1618 |
| Volume to Capacity | 0.00 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 0.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 0.7 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.9 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 27 | 51 | 0 | 73 | 3 | 1191 | 57 | 67 | 491 | 13 |
| Future Volume (vph) | 20 | 0 | 27 | 51 | 0 | 73 | 3 | 1191 | 57 | 67 | 491 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 21 | 0 | 28 | 54 | 0 | 77 | 3 | 1254 | 60 | 71 | 517 | 14 |
| RTOR Reduction (vph) | 0 | 13 | 13 | 0 | 72 | 0 | 0 | 0 | 26 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 21 | 1 | 1 | 54 | 5 | 0 | 3 | 1254 | 34 | 71 | 530 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 1.9 | 2.7 | 2.7 | 4.2 | 5.0 | | 0.8 | 41.5 | 41.5 | 6.0 | 46.7 | |
| Effective Green, g (s) | 1.9 | 2.7 | 2.7 | 4.2 | 5.0 | | 0.8 | 41.5 | 41.5 | 6.0 | 46.7 | |
| Actuated g/C Ratio | 0.03 | 0.04 | 0.04 | 0.06 | 0.07 | | 0.01 | 0.57 | 0.57 | 0.08 | 0.65 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 92 | 57 | 57 | 104 | 111 | | 38 | 2072 | 904 | 149 | 3303 | |
| v/s Ratio Prot | 0.01 | 0.00 | | c0.03 | c0.00 | | 0.00 | c0.35 | | c0.04 | 0.10 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.23 | 0.01 | 0.01 | 0.52 | 0.05 | | 0.08 | 0.61 | 0.04 | 0.48 | 0.16 | |
| Uniform Delay, d1 | 34.5 | 33.5 | 33.5 | 33.1 | 31.4 | | 35.4 | 10.1 | 6.7 | 31.7 | 5.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.0 | 0.0 | 1.8 | 0.1 | | 0.3 | 0.5 | 0.0 | 0.9 | 0.0 | |
| Delay (s) | 34.9 | 33.5 | 33.5 | 34.9 | 31.5 | | 35.7 | 10.6 | 6.7 | 32.5 | 5.1 | |
| Level of Service | C | C | C | C | C | | D | B | A | C | A | |
| Approach Delay (s) | | 34.1 | | | 32.9 | | | 10.4 | | | 8.3 | |
| Approach LOS | | C | | | C | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 11.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.55 | | |
| Actuated Cycle Length (s) | 72.3 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 58.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1198 | 29 | 34 | 533 | 2 |
| Future Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1198 | 29 | 34 | 533 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 2 | 0 | 48 | 21 | 0 | 33 | 3 | 1261 | 31 | 36 | 561 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 46 | 0 | 52 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1261 | 19 | 36 | 563 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.7 | 38.7 | 2.3 | 40.2 | |
| Effective Green, g (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 38.7 | 38.7 | 2.3 | 40.2 | |
| Actuated g/C Ratio | 0.04 | | 0.04 | | 0.04 | | 0.01 | 0.60 | 0.60 | 0.04 | 0.63 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 72 | | 65 | | 69 | | 43 | 2172 | 950 | 64 | 3209 | |
| v/s Ratio Prot | 0.00 | | | | c0.00 | | 0.00 | c0.35 | | c0.02 | 0.11 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.03 | | 0.03 | | 0.03 | | 0.07 | 0.58 | 0.02 | 0.56 | 0.18 | |
| Uniform Delay, d1 | 29.6 | | 29.6 | | 29.6 | | 31.4 | 7.8 | 5.2 | 30.5 | 5.1 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | | 0.1 | | 0.1 | | 0.3 | 0.4 | 0.0 | 6.6 | 0.0 | |
| Delay (s) | 29.7 | | 29.7 | | 29.7 | | 31.6 | 8.2 | 5.2 | 37.1 | 5.1 | |
| Level of Service | C | | C | | C | | C | A | A | D | A | |
| Approach Delay (s) | | 29.7 | | | 29.7 | | | 8.2 | | | 7.0 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 9.0 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 64.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1215 | 11 | 24 | 575 | 0 | 15 |
| Future Volume (Veh/h) | 1215 | 11 | 24 | 575 | 0 | 15 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1279 | 12 | 25 | 605 | 0 | 16 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.99 | |
| vC, conflicting volume | | | 1291 | | 1531 | 640 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1291 | | 1499 | 640 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 100 | 96 |
| cM capacity (veh/h) | | | 533 | | 106 | 418 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 640 | 640 | 12 | 25 | 202 | 202 | 202 | 16 |
| Volume Left | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 16 |
| cSH | 1700 | 1700 | 1700 | 533 | 1700 | 1700 | 1700 | 418 |
| Volume to Capacity | 0.38 | 0.38 | 0.01 | 0.05 | 0.12 | 0.12 | 0.12 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 12.1 | 0.0 | 0.0 | 0.0 | 13.9 |
| Lane LOS | | | | B | | | | B |
| Approach Delay (s) | 0.0 | | | 0.5 | | | | 13.9 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 43.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 284 | 562 | 0 | 0 | 370 | 205 | 19 | 2 | 664 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 284 | 562 | 0 | 0 | 370 | 205 | 19 | 2 | 664 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 299 | 592 | 0 | 0 | 389 | 216 | 20 | 2 | 699 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 389 | | | 592 | | | 1384 | 1579 | 592 | 1580 | 1579 | 194 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 389 | | | 592 | | | 1384 | 1579 | 592 | 1580 | 1579 | 194 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 75 | | | 100 | | | 76 | 98 | 58 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1181 | | | 994 | | | 84 | 82 | 1654 | 34 | 82 | 820 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 299 | 592 | 194 | 194 | 216 | 22 | 699 |
| Volume Left | 299 | 0 | 0 | 0 | 0 | 20 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 216 | 0 | 699 |
| cSH | 1181 | 1700 | 1700 | 1700 | 1700 | 84 | 1654 |
| Volume to Capacity | 0.25 | 0.35 | 0.11 | 0.11 | 0.13 | 0.26 | 0.42 |
| Queue Length 95th (ft) | 25 | 0 | 0 | 0 | 0 | 24 | 54 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 62.4 | 8.8 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.0 | | 0.0 | | | 10.4 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 77.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 18 | 658 | 177 | 212 | 188 | 130 |
| Future Volume (Veh/h) | 18 | 658 | 177 | 212 | 188 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 19 | 693 | 186 | 223 | 198 | 137 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 186 | | | | 917 | 186 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 186 | | | | 917 | 186 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 34 | 84 |
| cM capacity (veh/h) | 1401 | | | | 299 | 861 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 712 | 186 | 223 | 198 | 137 |
| Volume Left | 19 | 0 | 0 | 198 | 0 |
| Volume Right | 0 | 0 | 223 | 0 | 137 |
| cSH | 1401 | 1700 | 1700 | 299 | 861 |
| Volume to Capacity | 0.01 | 0.11 | 0.13 | 0.66 | 0.16 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 109 | 14 |
| Control Delay (s) | 0.4 | 0.0 | 0.0 | 37.8 | 10.0 |
| Lane LOS | A | | | E | A |
| Approach Delay (s) | 0.4 | 0.0 | | 26.4 | |
| Approach LOS | | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.3 | | |
| Intersection Capacity Utilization | 65.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 73 | 46 | 1 | 61 | 55 | 0 |
| Future Volume (Veh/h) | 73 | 46 | 1 | 61 | 55 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 77 | 48 | 1 | 64 | 58 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 125 | | 167 | 101 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 125 | | 167 | 101 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 93 | 100 |
| cM capacity (veh/h) | | | 1462 | | 823 | 954 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 125 | 65 | 58 |
| Volume Left | 0 | 1 | 58 |
| Volume Right | 48 | 0 | 0 |
| cSH | 1700 | 1462 | 823 |
| Volume to Capacity | 0.07 | 0.00 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 6 |
| Control Delay (s) | 0.0 | 0.1 | 9.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.1 | 9.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 16.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 23 | 108 | 3 | 37 | 129 |
| Future Volume (Veh/h) | 1 | 23 | 108 | 3 | 37 | 129 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1 | 24 | 114 | 3 | 39 | 136 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 330 | 116 | | | 117 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 330 | 116 | | | 117 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 97 | | | 97 | |
| cM capacity (veh/h) | 647 | 937 | | | 1471 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 25 | 117 | 175 |
| Volume Left | 1 | 0 | 39 |
| Volume Right | 24 | 3 | 0 |
| cSH | 920 | 1700 | 1471 |
| Volume to Capacity | 0.03 | 0.07 | 0.03 |
| Queue Length 95th (ft) | 2 | 0 | 2 |
| Control Delay (s) | 9.0 | 0.0 | 1.8 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 1.8 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 25.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 24 | 7 | 21 | 8 | 5 |
| Future Volume (Veh/h) | 8 | 24 | 7 | 21 | 8 | 5 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 8 | 25 | 7 | 22 | 8 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 39 | 18 | | | 29 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 39 | 18 | | | 29 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 99 | 98 | | | 99 | |
| cM capacity (veh/h) | 968 | 1061 | | | 1584 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 33 | 29 | 13 |
| Volume Left | 8 | 0 | 8 |
| Volume Right | 25 | 22 | 0 |
| cSH | 1036 | 1700 | 1584 |
| Volume to Capacity | 0.03 | 0.02 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 4.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 4.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 17.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing Plus Project AM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 6 | 0 | 2 | 130 | 0 | 112 | 24 | 376 | 38 | 101 | 1479 | 20 |
| Future Volume (vph) | 6 | 0 | 2 | 130 | 0 | 112 | 24 | 376 | 38 | 101 | 1479 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1599 | | 3502 | 3574 | 1581 | 1805 | 5176 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 6 | 0 | 2 | 140 | 0 | 120 | 26 | 404 | 41 | 109 | 1590 | 22 |
| RTOR Reduction (vph) | 0 | 1 | 1 | 0 | 100 | 0 | 0 | 0 | 25 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 6 | 0 | 0 | 140 | 20 | 0 | 26 | 404 | 16 | 109 | 1611 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 0.7 | 0.6 | 0.6 | 9.4 | 9.3 | | 1.6 | 22.2 | 22.2 | 7.0 | 27.6 | |
| Effective Green, g (s) | 0.7 | 0.6 | 0.6 | 9.4 | 9.3 | | 1.6 | 22.2 | 22.2 | 7.0 | 27.6 | |
| Actuated g/C Ratio | 0.01 | 0.01 | 0.01 | 0.16 | 0.16 | | 0.03 | 0.39 | 0.39 | 0.12 | 0.48 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 42 | 16 | 16 | 297 | 260 | | 98 | 1389 | 614 | 221 | 2501 | |
| v/s Ratio Prot | 0.00 | 0.00 | | c0.08 | c0.01 | | 0.01 | 0.11 | | c0.06 | c0.31 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.14 | 0.00 | 0.00 | 0.47 | 0.08 | | 0.27 | 0.29 | 0.03 | 0.49 | 0.64 | |
| Uniform Delay, d1 | 27.9 | 28.0 | 28.0 | 21.6 | 20.3 | | 27.2 | 12.0 | 10.8 | 23.4 | 11.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.6 | 0.0 | 0.0 | 0.4 | 0.0 | | 0.5 | 0.1 | 0.0 | 0.6 | 0.6 | |
| Delay (s) | 28.5 | 28.0 | 28.0 | 22.0 | 20.3 | | 27.7 | 12.1 | 10.8 | 24.0 | 11.6 | |
| Level of Service | C | C | C | C | C | | C | B | B | C | B | |
| Approach Delay (s) | | 28.3 | | | 21.2 | | | 12.9 | | | 12.4 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 13.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 57.1 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 57.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 397 | 7 | 33 | 1577 | 1 |
| Future Volume (vph) | 0 | 0 | 2 | 25 | 0 | 39 | 25 | 397 | 7 | 33 | 1577 | 1 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5187 | |
| Flt Permitted | | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | | | 1615 | | 1694 | | 3502 | 3574 | 1582 | 1805 | 5187 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 0 | 0 | 2 | 27 | 0 | 42 | 27 | 427 | 8 | 35 | 1696 | 1 |
| RTOR Reduction (vph) | 0 | 0 | 2 | 0 | 65 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 0 | 0 | 0 | 0 | 4 | 0 | 27 | 427 | 5 | 35 | 1697 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | | | 0.8 | | 4.0 | | 0.9 | 37.6 | 37.6 | 2.7 | 39.4 | |
| Effective Green, g (s) | | | 0.8 | | 4.0 | | 0.9 | 37.6 | 37.6 | 2.7 | 39.4 | |
| Actuated g/C Ratio | | | 0.01 | | 0.06 | | 0.01 | 0.59 | 0.59 | 0.04 | 0.62 | |
| Clearance Time (s) | | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | | | 20 | | 107 | | 49 | 2126 | 941 | 77 | 3233 | |
| v/s Ratio Prot | | | | | c0.00 | | 0.01 | 0.12 | | c0.02 | c0.33 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.00 | | | |
| v/c Ratio | | | 0.00 | | 0.04 | | 0.55 | 0.20 | 0.01 | 0.45 | 0.52 | |
| Uniform Delay, d1 | | | 30.8 | | 27.8 | | 30.9 | 5.9 | 5.2 | 29.5 | 6.7 | |
| Progression Factor | | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | | | 0.0 | | 0.1 | | 7.4 | 0.0 | 0.0 | 1.5 | 0.2 | |
| Delay (s) | | | 30.8 | | 27.9 | | 38.3 | 5.9 | 5.2 | 31.1 | 6.8 | |
| Level of Service | | | C | | C | | D | A | A | C | A | |
| Approach Delay (s) | | 30.8 | | | 27.9 | | | 7.8 | | | 7.3 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.1 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.49 | | |
| Actuated Cycle Length (s) | 63.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 51.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 409 | 4 | 0 | 1604 | 0 | 20 |
| Future Volume (Veh/h) | 409 | 4 | 0 | 1604 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 440 | 4 | 0 | 1725 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.81 | |
| vC, conflicting volume | | | 444 | | 1017 | 149 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 444 | | 214 | 149 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 97 |
| cM capacity (veh/h) | | | 1112 | | 613 | 871 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 176 | 176 | 92 | 0 | 575 | 575 | 575 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 871 |
| Volume to Capacity | 0.10 | 0.10 | 0.05 | 0.00 | 0.34 | 0.34 | 0.34 | 0.03 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 9.2 |
| Lane LOS | | | | | | | | A |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 9.2 |
| Approach LOS | | | | | | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 34.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 90 | 178 | 0 | 0 | 1404 | 200 | 13 | 1 | 233 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 90 | 178 | 0 | 0 | 1404 | 200 | 13 | 1 | 233 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 97 | 191 | 0 | 0 | 1510 | 215 | 14 | 1 | 251 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.73 | | | | | | 0.73 | 0.73 | | 0.73 | 0.73 | 0.73 |
| vC, conflicting volume | 1510 | | | 191 | | | 1140 | 1895 | 191 | 1896 | 1895 | 755 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 956 | | | 191 | | | 449 | 1484 | 191 | 1485 | 1484 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 82 | | | 100 | | | 95 | 99 | 85 | 100 | 100 | 100 |
| cM capacity (veh/h) | 526 | | | 1395 | | | 288 | 75 | 1644 | 46 | 75 | 795 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 97 | 191 | 755 | 755 | 215 | 15 | 251 |
| Volume Left | 97 | 0 | 0 | 0 | 0 | 14 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 215 | 0 | 251 |
| cSH | 526 | 1700 | 1700 | 1700 | 1700 | 242 | 1644 |
| Volume to Capacity | 0.18 | 0.11 | 0.44 | 0.44 | 0.13 | 0.06 | 0.15 |
| Queue Length 95th (ft) | 17 | 0 | 0 | 0 | 0 | 5 | 13 |
| Control Delay (s) | 13.4 | 0.0 | 0.0 | 0.0 | 0.0 | 20.9 | 7.6 |
| Lane LOS | B | | | | | C | A |
| Approach Delay (s) | 4.5 | | 0.0 | | | 8.3 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 57.1% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 133 | 201 | 412 | 1005 | 71 | 120 |
| Future Volume (Veh/h) | 133 | 201 | 412 | 1005 | 71 | 120 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 143 | 216 | 443 | 1081 | 76 | 129 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 443 | | | | 945 | 443 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 443 | | | | 945 | 443 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 87 | | | | 69 | 79 |
| cM capacity (veh/h) | 1128 | | | | 246 | 619 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 359 | 443 | 1081 | 76 | 129 |
| Volume Left | 143 | 0 | 0 | 76 | 0 |
| Volume Right | 0 | 0 | 1081 | 0 | 129 |
| cSH | 1128 | 1700 | 1700 | 246 | 619 |
| Volume to Capacity | 0.13 | 0.26 | 0.64 | 0.31 | 0.21 |
| Queue Length 95th (ft) | 11 | 0 | 0 | 32 | 19 |
| Control Delay (s) | 4.2 | 0.0 | 0.0 | 26.0 | 12.3 |
| Lane LOS | A | | | D | B |
| Approach Delay (s) | 4.2 | 0.0 | | 17.4 | |
| Approach LOS | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 86.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 90 | 38 | 1 | 180 | 56 | 2 |
| Future Volume (Veh/h) | 90 | 38 | 1 | 180 | 56 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 97 | 41 | 1 | 194 | 60 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 138 | | 314 | 118 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 138 | | 314 | 118 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 91 | 100 |
| cM capacity (veh/h) | | | 1446 | | 677 | 932 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 138 | 195 | 62 |
| Volume Left | 0 | 1 | 60 |
| Volume Right | 41 | 0 | 2 |
| cSH | 1700 | 1446 | 683 |
| Volume to Capacity | 0.08 | 0.00 | 0.09 |
| Queue Length 95th (ft) | 0 | 0 | 7 |
| Control Delay (s) | 0.0 | 0.0 | 10.8 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 10.8 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 20.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 7 | 29 | 44 | 0 | 24 | 430 |
| Future Volume (Veh/h) | 7 | 29 | 44 | 0 | 24 | 430 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 8 | 31 | 47 | 0 | 26 | 462 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 561 | 47 | | | 47 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 561 | 47 | | | 47 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 97 | | | 98 | |
| cM capacity (veh/h) | 481 | 1022 | | | 1560 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 39 | 47 | 488 |
| Volume Left | 8 | 0 | 26 |
| Volume Right | 31 | 0 | 0 |
| cSH | 830 | 1700 | 1560 |
| Volume to Capacity | 0.05 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 4 | 0 | 1 |
| Control Delay (s) | 9.5 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.5 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 40.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 1 | 3 | 1 | 1 | 8 |
| Future Volume (Veh/h) | 2 | 1 | 3 | 1 | 1 | 8 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 1 | 3 | 1 | 1 | 9 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 16 | 4 | | | 4 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 16 | 4 | | | 4 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 1001 | 1080 | | | 1618 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 3 | 4 | 10 |
| Volume Left | 2 | 0 | 1 |
| Volume Right | 1 | 1 | 0 |
| cSH | 1026 | 1700 | 1618 |
| Volume to Capacity | 0.00 | 0.00 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 0.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 0.7 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.9 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Existing Plus Project PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 27 | 66 | 0 | 80 | 3 | 1191 | 91 | 79 | 491 | 13 |
| Future Volume (vph) | 20 | 0 | 27 | 66 | 0 | 80 | 3 | 1191 | 91 | 79 | 491 | 13 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5115 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 21 | 0 | 28 | 69 | 0 | 84 | 3 | 1254 | 96 | 83 | 517 | 14 |
| RTOR Reduction (vph) | 0 | 14 | 14 | 0 | 78 | 0 | 0 | 0 | 42 | 0 | 1 | 0 |
| Lane Group Flow (vph) | 21 | 0 | 0 | 69 | 6 | 0 | 3 | 1254 | 54 | 83 | 530 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 1.9 | 1.5 | 1.5 | 6.0 | 5.6 | | 0.8 | 41.5 | 41.5 | 6.5 | 47.2 | |
| Effective Green, g (s) | 1.9 | 1.5 | 1.5 | 6.0 | 5.6 | | 0.8 | 41.5 | 41.5 | 6.5 | 47.2 | |
| Actuated g/C Ratio | 0.03 | 0.02 | 0.02 | 0.08 | 0.08 | | 0.01 | 0.57 | 0.57 | 0.09 | 0.64 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 90 | 31 | 31 | 147 | 123 | | 38 | 2041 | 891 | 159 | 3289 | |
| v/s Ratio Prot | 0.01 | 0.00 | | c0.04 | c0.00 | | 0.00 | c0.35 | | c0.05 | 0.10 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.03 | | | |
| v/c Ratio | 0.23 | 0.01 | 0.01 | 0.47 | 0.05 | | 0.08 | 0.61 | 0.06 | 0.52 | 0.16 | |
| Uniform Delay, d1 | 35.0 | 35.2 | 35.2 | 32.2 | 31.4 | | 35.9 | 10.6 | 7.2 | 32.0 | 5.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.5 | 0.0 | 0.0 | 0.9 | 0.1 | | 0.3 | 0.6 | 0.0 | 1.4 | 0.0 | |
| Delay (s) | 35.5 | 35.3 | 35.3 | 33.0 | 31.5 | | 36.3 | 11.2 | 7.2 | 33.4 | 5.2 | |
| Level of Service | D | D | D | C | C | | D | B | A | C | A | |
| Approach Delay (s) | | 35.4 | | | 32.2 | | | 11.0 | | | 9.0 | |
| Approach LOS | | D | | | C | | | B | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 12.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.57 | | |
| Actuated Cycle Length (s) | 73.4 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 59.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1232 | 29 | 34 | 548 | 2 |
| Future Volume (vph) | 2 | 0 | 46 | 20 | 0 | 31 | 3 | 1232 | 29 | 34 | 548 | 2 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.92 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1710 | | 3502 | 3610 | 1579 | 1805 | 5133 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 2 | 0 | 48 | 21 | 0 | 33 | 3 | 1297 | 31 | 36 | 577 | 2 |
| RTOR Reduction (vph) | 0 | 0 | 46 | 0 | 52 | 0 | 0 | 0 | 12 | 0 | 0 | 0 |
| Lane Group Flow (vph) | 2 | 0 | 2 | 0 | 2 | 0 | 3 | 1297 | 19 | 36 | 579 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 40.5 | 40.5 | 2.4 | 42.1 | |
| Effective Green, g (s) | 2.6 | | 2.6 | | 2.6 | | 0.8 | 40.5 | 40.5 | 2.4 | 42.1 | |
| Actuated g/C Ratio | 0.04 | | 0.04 | | 0.04 | | 0.01 | 0.61 | 0.61 | 0.04 | 0.64 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 70 | | 63 | | 67 | | 42 | 2208 | 966 | 65 | 3264 | |
| v/s Ratio Prot | 0.00 | | | | c0.00 | | 0.00 | c0.36 | | c0.02 | 0.11 | |
| v/s Ratio Perm | | | c0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.03 | | 0.03 | | 0.03 | | 0.07 | 0.59 | 0.02 | 0.55 | 0.18 | |
| Uniform Delay, d1 | 30.6 | | 30.6 | | 30.6 | | 32.3 | 7.8 | 5.0 | 31.4 | 4.9 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.1 | | 0.1 | | 0.1 | | 0.3 | 0.4 | 0.0 | 5.7 | 0.0 | |
| Delay (s) | 30.6 | | 30.7 | | 30.7 | | 32.6 | 8.2 | 5.1 | 37.1 | 5.0 | |
| Level of Service | C | | C | | C | | C | A | A | D | A | |
| Approach Delay (s) | | 30.7 | | | 30.7 | | | 8.2 | | | 6.8 | |
| Approach LOS | | C | | | C | | | A | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 8.9 | HCM 2000 Level of Service | A |
| HCM 2000 Volume to Capacity ratio | 0.52 | | |
| Actuated Cycle Length (s) | 66.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 52.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1249 | 11 | 24 | 590 | 0 | 15 |
| Future Volume (Veh/h) | 1249 | 11 | 24 | 590 | 0 | 15 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1315 | 12 | 25 | 621 | 0 | 16 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.99 | |
| vC, conflicting volume | | | 1327 | | 1572 | 658 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1327 | | 1535 | 658 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 100 | 96 |
| cM capacity (veh/h) | | | 516 | | 100 | 407 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 658 | 658 | 12 | 25 | 207 | 207 | 207 | 16 |
| Volume Left | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 16 |
| cSH | 1700 | 1700 | 1700 | 516 | 1700 | 1700 | 1700 | 407 |
| Volume to Capacity | 0.39 | 0.39 | 0.01 | 0.05 | 0.12 | 0.12 | 0.12 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 12.3 | 0.0 | 0.0 | 0.0 | 14.2 |
| Lane LOS | | | | B | | | | B |
| Approach Delay (s) | 0.0 | | | 0.5 | | | | 14.2 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 44.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 281 | 578 | 0 | 0 | 377 | 213 | 13 | 2 | 674 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 281 | 578 | 0 | 0 | 377 | 213 | 13 | 2 | 674 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 296 | 608 | 0 | 0 | 397 | 224 | 14 | 2 | 709 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 397 | | | 608 | | | 1398 | 1597 | 608 | 1598 | 1597 | 198 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 397 | | | 608 | | | 1398 | 1597 | 608 | 1598 | 1597 | 198 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 75 | | | 100 | | | 83 | 98 | 57 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1173 | | | 980 | | | 82 | 80 | 1655 | 33 | 80 | 816 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 296 | 608 | 198 | 198 | 224 | 16 | 709 |
| Volume Left | 296 | 0 | 0 | 0 | 0 | 14 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 224 | 0 | 709 |
| cSH | 1173 | 1700 | 1700 | 1700 | 1700 | 82 | 1655 |
| Volume to Capacity | 0.25 | 0.36 | 0.12 | 0.12 | 0.13 | 0.20 | 0.43 |
| Queue Length 95th (ft) | 25 | 0 | 0 | 0 | 0 | 17 | 55 |
| Control Delay (s) | 9.1 | 0.0 | 0.0 | 0.0 | 0.0 | 59.2 | 8.8 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.0 | | 0.0 | | | 9.9 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.4 | | |
| Intersection Capacity Utilization | 78.8% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 15 | 656 | 172 | 218 | 203 | 118 |
| Future Volume (Veh/h) | 15 | 656 | 172 | 218 | 203 | 118 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 16 | 691 | 181 | 229 | 214 | 124 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 181 | | | | 904 | 181 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 181 | | | | 904 | 181 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 99 | | | | 30 | 86 |
| cM capacity (veh/h) | 1407 | | | | 305 | 867 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 707 | 181 | 229 | 214 | 124 |
| Volume Left | 16 | 0 | 0 | 214 | 0 |
| Volume Right | 0 | 0 | 229 | 0 | 124 |
| cSH | 1407 | 1700 | 1700 | 305 | 867 |
| Volume to Capacity | 0.01 | 0.11 | 0.13 | 0.70 | 0.14 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 123 | 12 |
| Control Delay (s) | 0.3 | 0.0 | 0.0 | 40.4 | 9.8 |
| Lane LOS | A | | | E | A |
| Approach Delay (s) | 0.3 | 0.0 | | 29.2 | |
| Approach LOS | | | | D | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.9 | | |
| Intersection Capacity Utilization | 64.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 125 | 40 | 1 | 105 | 33 | 0 |
| Future Volume (Veh/h) | 125 | 40 | 1 | 105 | 33 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 132 | 42 | 1 | 111 | 35 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 174 | | 266 | 153 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 174 | | 266 | 153 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 95 | 100 |
| cM capacity (veh/h) | | | 1403 | | 723 | 893 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 174 | 112 | 35 |
| Volume Left | 0 | 1 | 35 |
| Volume Right | 42 | 0 | 0 |
| cSH | 1700 | 1403 | 723 |
| Volume to Capacity | 0.10 | 0.00 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 4 |
| Control Delay (s) | 0.0 | 0.1 | 10.2 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 17 | 108 | 3 | 19 | 129 |
| Future Volume (Veh/h) | 1 | 17 | 108 | 3 | 19 | 129 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1 | 18 | 114 | 3 | 20 | 136 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 292 | 116 | | | 117 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 292 | 116 | | | 117 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 98 | | | 99 | |
| cM capacity (veh/h) | 690 | 937 | | | 1471 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 19 | 117 | 156 |
| Volume Left | 1 | 0 | 20 |
| Volume Right | 18 | 3 | 0 |
| cSH | 920 | 1700 | 1471 |
| Volume to Capacity | 0.02 | 0.07 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 9.0 | 0.0 | 1.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 1.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 24.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 7 | 3 | 2 | 5 |
| Future Volume (Veh/h) | 2 | 2 | 7 | 3 | 2 | 5 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 7 | 3 | 2 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 18 | 8 | | | 10 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 18 | 8 | | | 10 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 999 | 1073 | | | 1610 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 10 | 7 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 3 | 0 |
| cSH | 1035 | 1700 | 1610 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 2.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 2.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 120 | 5 | 120 | 190 | 560 | 40 | 110 | 1470 | 260 |
| Future Volume (vph) | 70 | 0 | 10 | 120 | 5 | 120 | 190 | 560 | 40 | 110 | 1470 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1610 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1610 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 129 | 5 | 129 | 204 | 602 | 43 | 118 | 1581 | 280 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 113 | 0 | 0 | 0 | 23 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 129 | 21 | 0 | 204 | 602 | 20 | 118 | 1841 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.8 | 0.7 | 0.7 | 13.1 | 9.0 | | 8.6 | 35.2 | 35.2 | 7.7 | 34.3 | |
| Effective Green, g (s) | 4.8 | 0.7 | 0.7 | 13.1 | 9.0 | | 8.6 | 35.2 | 35.2 | 7.7 | 34.3 | |
| Actuated g/C Ratio | 0.06 | 0.01 | 0.01 | 0.18 | 0.12 | | 0.12 | 0.47 | 0.47 | 0.10 | 0.46 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 225 | 14 | 14 | 316 | 194 | | 403 | 1686 | 745 | 186 | 2331 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.07 | c0.01 | | 0.06 | 0.17 | | c0.07 | c0.36 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.33 | 0.00 | 0.00 | 0.41 | 0.11 | | 0.51 | 0.36 | 0.03 | 0.63 | 0.79 | |
| Uniform Delay, d1 | 33.4 | 36.6 | 36.6 | 27.3 | 29.2 | | 31.0 | 12.5 | 10.5 | 32.1 | 17.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | 0.0 | 0.3 | 0.1 | | 0.4 | 0.1 | 0.0 | 5.1 | 1.9 | |
| Delay (s) | 33.7 | 36.6 | 36.6 | 27.6 | 29.3 | | 31.4 | 12.6 | 10.6 | 37.2 | 18.9 | |
| Level of Service | C | D | D | C | C | | C | B | B | D | B | |
| Approach Delay (s) | | 34.1 | | | 28.5 | | | 17.0 | | | 20.0 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.66 | | |
| Actuated Cycle Length (s) | 74.6 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 65.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 730 | 10 | 40 | 1310 | 250 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 730 | 10 | 40 | 1310 | 250 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5052 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5052 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 376 | 785 | 11 | 43 | 1409 | 269 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 376 | 785 | 7 | 43 | 1659 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 102 | | 91 | | 83 | | 553 | 2151 | 952 | 97 | 2516 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.22 | | 0.02 | c0.33 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.36 | 0.01 | 0.44 | 0.66 | |
| Uniform Delay, d1 | 34.2 | | 33.9 | | 34.4 | | 30.1 | 7.7 | 6.0 | 34.8 | 14.2 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.6 | 0.1 | 0.0 | 1.2 | 0.6 | |
| Delay (s) | 34.6 | | 34.0 | | 34.5 | | 32.8 | 7.8 | 6.0 | 36.0 | 14.9 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.1 | | | 34.5 | | | 15.8 | | | 15.4 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 75.9 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1070 | 10 | 0 | 1440 | 0 | 20 |
| Future Volume (Veh/h) | 1070 | 10 | 0 | 1440 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1151 | 11 | 0 | 1548 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.77 | |
| vC, conflicting volume | | | 1162 | | 1667 | 576 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1162 | | 839 | 576 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 95 |
| cM capacity (veh/h) | | | 597 | | 236 | 461 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 576 | 576 | 11 | 0 | 516 | 516 | 516 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 461 |
| Volume to Capacity | 0.34 | 0.34 | 0.01 | 0.00 | 0.30 | 0.30 | 0.30 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.2 |
| Lane LOS | | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 13.2 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 39.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 120 | 610 | 0 | 0 | 1080 | 360 | 20 | 0 | 470 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 120 | 610 | 0 | 0 | 1080 | 360 | 20 | 0 | 470 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 129 | 656 | 0 | 0 | 1161 | 387 | 22 | 0 | 505 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.77 | | | | | | 0.77 | 0.77 | | 0.77 | 0.77 | 0.77 |
| vC, conflicting volume | 1161 | | | 656 | | | 1494 | 2075 | 656 | 2075 | 2075 | 580 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 604 | | | 656 | | | 1039 | 1795 | 656 | 1795 | 1795 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 83 | | | 100 | | | 80 | 100 | 69 | 100 | 100 | 100 |
| cM capacity (veh/h) | 749 | | | 941 | | | 110 | 52 | 1655 | 24 | 52 | 837 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 129 | 656 | 580 | 580 | 387 | 22 | 505 |
| Volume Left | 129 | 0 | 0 | 0 | 0 | 22 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 387 | 0 | 505 |
| cSH | 749 | 1700 | 1700 | 1700 | 1700 | 110 | 1655 |
| Volume to Capacity | 0.17 | 0.39 | 0.34 | 0.34 | 0.23 | 0.20 | 0.31 |
| Queue Length 95th (ft) | 15 | 0 | 0 | 0 | 0 | 18 | 33 |
| Control Delay (s) | 10.8 | 0.0 | 0.0 | 0.0 | 0.0 | 45.6 | 8.1 |
| Lane LOS | B | | | | | E | A |
| Approach Delay (s) | 1.8 | | 0.0 | | | 9.7 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 67.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 140 | 310 | 440 | 660 | 420 | 130 |
| Future Volume (Veh/h) | 140 | 310 | 440 | 660 | 420 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 151 | 333 | 473 | 710 | 452 | 140 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 473 | | | | 1108 | 473 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 473 | | | | 1108 | 473 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 86 | | | | 0 | 76 |
| cM capacity (veh/h) | 1099 | | | | 194 | 595 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 484 | 473 | 710 | 452 | 140 |
| Volume Left | 151 | 0 | 0 | 452 | 0 |
| Volume Right | 0 | 0 | 710 | 0 | 140 |
| cSH | 1099 | 1700 | 1700 | 194 | 595 |
| Volume to Capacity | 0.14 | 0.28 | 0.42 | 2.33 | 0.24 |
| Queue Length 95th (ft) | 12 | 0 | 0 | 921 | 23 |
| Control Delay (s) | 3.8 | 0.0 | 0.0 | 651.9 | 12.9 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.8 | 0.0 | | 500.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 132.0 | | |
| Intersection Capacity Utilization | 80.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 80 | 60 | 1 | 160 | 80 | 2 |
| Future Volume (Veh/h) | 80 | 60 | 1 | 160 | 80 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 86 | 65 | 1 | 172 | 86 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 151 | | 294 | 120 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 151 | | 294 | 120 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 88 | 100 |
| cM capacity (veh/h) | | | 1430 | | 696 | 931 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 151 | 173 | 88 |
| Volume Left | 0 | 1 | 86 |
| Volume Right | 65 | 0 | 2 |
| cSH | 1700 | 1430 | 700 |
| Volume to Capacity | 0.09 | 0.00 | 0.13 |
| Queue Length 95th (ft) | 0 | 0 | 11 |
| Control Delay (s) | 0.0 | 0.0 | 10.9 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 10.9 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 20.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 40 | 140 | 0 | 50 | 380 |
| Future Volume (Veh/h) | 10 | 40 | 140 | 0 | 50 | 380 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 11 | 43 | 151 | 0 | 54 | 409 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 668 | 151 | | | 151 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 668 | 151 | | | 151 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 95 | | | 96 | |
| cM capacity (veh/h) | 407 | 895 | | | 1430 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 54 | 151 | 463 |
| Volume Left | 11 | 0 | 54 |
| Volume Right | 43 | 0 | 0 |
| cSH | 720 | 1700 | 1430 |
| Volume to Capacity | 0.08 | 0.09 | 0.04 |
| Queue Length 95th (ft) | 6 | 0 | 3 |
| Control Delay (s) | 10.4 | 0.0 | 1.2 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.4 | 0.0 | 1.2 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.7 | | |
| Intersection Capacity Utilization | 43.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 30 | 10 | 20 | 20 | 10 |
| Future Volume (Veh/h) | 30 | 30 | 10 | 20 | 20 | 10 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 32 | 32 | 11 | 22 | 22 | 11 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 78 | 22 | | | 33 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 78 | 22 | | | 33 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 96 | 97 | | | 99 | |
| cM capacity (veh/h) | 911 | 1055 | | | 1579 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 64 | 33 | 33 |
| Volume Left | 32 | 0 | 22 |
| Volume Right | 32 | 22 | 0 |
| cSH | 978 | 1700 | 1579 |
| Volume to Capacity | 0.07 | 0.02 | 0.01 |
| Queue Length 95th (ft) | 5 | 0 | 1 |
| Control Delay (s) | 8.9 | 0.0 | 4.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.9 | 0.0 | 4.9 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.6 | | |
| Intersection Capacity Utilization | 18.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term No Project PM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 280 | 5 | 150 | 70 | 0 | 80 | 20 | 1460 | 70 | 110 | 500 | 60 |
| Future Volume (vph) | 280 | 5 | 150 | 70 | 0 | 80 | 20 | 1460 | 70 | 110 | 500 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 295 | 5 | 158 | 74 | 0 | 84 | 21 | 1537 | 74 | 116 | 526 | 63 |
| RTOR Reduction (vph) | 0 | 67 | 67 | 0 | 76 | 0 | 0 | 0 | 40 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 295 | 17 | 12 | 74 | 8 | 0 | 21 | 1537 | 34 | 116 | 579 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.1 | 12.5 | 12.5 | 6.6 | 8.0 | | 1.9 | 39.3 | 39.3 | 8.3 | 45.7 | |
| Effective Green, g (s) | 11.1 | 12.5 | 12.5 | 6.6 | 8.0 | | 1.9 | 39.3 | 39.3 | 8.3 | 45.7 | |
| Actuated g/C Ratio | 0.13 | 0.15 | 0.15 | 0.08 | 0.09 | | 0.02 | 0.46 | 0.46 | 0.10 | 0.54 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 459 | 229 | 226 | 140 | 152 | | 78 | 1676 | 731 | 177 | 2728 | |
| v/s Ratio Prot | c0.08 | c0.01 | | 0.04 | 0.00 | | 0.01 | c0.43 | | c0.06 | 0.11 | |
| v/s Ratio Perm | | | 0.01 | | | | | | 0.02 | | | |
| v/c Ratio | 0.64 | 0.07 | 0.05 | 0.53 | 0.05 | | 0.27 | 0.92 | 0.05 | 0.66 | 0.21 | |
| Uniform Delay, d1 | 34.9 | 31.1 | 31.0 | 37.5 | 34.9 | | 40.7 | 21.1 | 12.4 | 36.8 | 10.1 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.3 | 0.0 | 0.0 | 1.7 | 0.1 | | 0.7 | 8.3 | 0.0 | 6.5 | 0.0 | |
| Delay (s) | 37.2 | 31.1 | 31.0 | 39.2 | 34.9 | | 41.3 | 29.4 | 12.4 | 43.3 | 10.1 | |
| Level of Service | D | C | C | D | C | | D | C | B | D | B | |
| Approach Delay (s) | | 35.0 | | | 36.9 | | | 28.8 | | | 15.6 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 27.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 84.6 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 72.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1360 | 30 | 40 | 660 | 20 |
| Future Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1360 | 30 | 40 | 660 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5112 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5112 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 158 | 0 | 379 | 21 | 0 | 42 | 63 | 1432 | 32 | 42 | 695 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 323 | 0 | 61 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 158 | 0 | 56 | 0 | 2 | 0 | 63 | 1432 | 16 | 42 | 714 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Effective Green, g (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Actuated g/C Ratio | 0.15 | | 0.15 | | 0.04 | | 0.05 | 0.51 | 0.51 | 0.05 | 0.51 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 268 | | 240 | | 62 | | 162 | 1837 | 803 | 93 | 2631 | |
| v/s Ratio Prot | c0.09 | | | | c0.00 | | 0.02 | c0.40 | | c0.02 | 0.14 | |
| v/s Ratio Perm | | | 0.03 | | | | | | 0.01 | | | |
| v/c Ratio | 0.59 | | 0.23 | | 0.04 | | 0.39 | 0.78 | 0.02 | 0.45 | 0.27 | |
| Uniform Delay, d1 | 28.3 | | 26.8 | | 33.1 | | 33.0 | 14.2 | 8.7 | 32.8 | 9.8 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.1 | | 0.2 | | 0.1 | | 0.6 | 2.2 | 0.0 | 1.3 | 0.1 | |
| Delay (s) | 30.5 | | 27.0 | | 33.2 | | 33.6 | 16.4 | 8.7 | 34.1 | 9.8 | |
| Level of Service | C | | C | | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.0 | | | 33.2 | | | 17.0 | | | 11.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 17.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 71.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 60.8% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1430 | 20 | 30 | 1010 | 0 | 20 |
| Future Volume (Veh/h) | 1430 | 20 | 30 | 1010 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1505 | 21 | 32 | 1063 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.94 | |
| vC, conflicting volume | | | 1526 | | 1923 | 752 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1526 | | 1768 | 752 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 93 | | 100 | 94 |
| cM capacity (veh/h) | | | 433 | | 65 | 353 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 752 | 752 | 21 | 32 | 354 | 354 | 354 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 433 | 1700 | 1700 | 1700 | 353 |
| Volume to Capacity | 0.44 | 0.44 | 0.01 | 0.07 | 0.21 | 0.21 | 0.21 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.0 | 0.0 | 0.0 | 0.0 | 15.9 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.4 | | | | 15.9 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 49.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 330 | 700 | 0 | 0 | 430 | 580 | 20 | 0 | 750 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 330 | 700 | 0 | 0 | 430 | 580 | 20 | 0 | 750 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 347 | 737 | 0 | 0 | 453 | 611 | 21 | 0 | 789 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 453 | | | 737 | | | 1658 | 1884 | 737 | 1884 | 1884 | 226 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 453 | | | 737 | | | 1658 | 1884 | 737 | 1884 | 1884 | 226 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 69 | | | 100 | | | 58 | 100 | 52 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1118 | | | 878 | | | 50 | 49 | 1656 | 18 | 49 | 783 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 347 | 737 | 226 | 226 | 611 | 21 | 789 |
| Volume Left | 347 | 0 | 0 | 0 | 0 | 21 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 611 | 0 | 789 |
| cSH | 1118 | 1700 | 1700 | 1700 | 1700 | 50 | 1656 |
| Volume to Capacity | 0.31 | 0.43 | 0.13 | 0.13 | 0.36 | 0.42 | 0.48 |
| Queue Length 95th (ft) | 33 | 0 | 0 | 0 | 0 | 38 | 67 |
| Control Delay (s) | 9.7 | 0.0 | 0.0 | 0.0 | 0.0 | 122.3 | 9.1 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.1 | | 0.0 | | | 12.1 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.4 | | |
| Intersection Capacity Utilization | 89.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 780 | 190 | 260 | 250 | 160 |
| Future Volume (Veh/h) | 30 | 780 | 190 | 260 | 250 | 160 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 32 | 821 | 200 | 274 | 263 | 168 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 200 | | | | 1085 | 200 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 200 | | | | 1085 | 200 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 0 | 80 |
| cM capacity (veh/h) | 1384 | | | | 235 | 846 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 853 | 200 | 274 | 263 | 168 |
| Volume Left | 32 | 0 | 0 | 263 | 0 |
| Volume Right | 0 | 0 | 274 | 0 | 168 |
| cSH | 1384 | 1700 | 1700 | 235 | 846 |
| Volume to Capacity | 0.02 | 0.12 | 0.16 | 1.12 | 0.20 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 295 | 18 |
| Control Delay (s) | 0.6 | 0.0 | 0.0 | 138.5 | 10.3 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.6 | 0.0 | | 88.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 22.0 | | |
| Intersection Capacity Utilization | 76.6% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 100 | 70 | 1 | 80 | 60 | 0 |
| Future Volume (Veh/h) | 100 | 70 | 1 | 80 | 60 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 105 | 74 | 1 | 84 | 63 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 179 | | 228 | 142 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 179 | | 228 | 142 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 92 | 100 |
| cM capacity (veh/h) | | | 1397 | | 760 | 906 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 179 | 85 | 63 |
| Volume Left | 0 | 1 | 63 |
| Volume Right | 74 | 0 | 0 |
| cSH | 1700 | 1397 | 760 |
| Volume to Capacity | 0.11 | 0.00 | 0.08 |
| Queue Length 95th (ft) | 0 | 0 | 7 |
| Control Delay (s) | 0.0 | 0.1 | 10.2 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 19.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 30 | 110 | 5 | 50 | 180 |
| Future Volume (Veh/h) | 10 | 30 | 110 | 5 | 50 | 180 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 32 | 116 | 5 | 53 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 414 | 118 | | | 121 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 414 | 118 | | | 121 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 97 | | | 96 | |
| cM capacity (veh/h) | 574 | 933 | | | 1467 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 43 | 121 | 242 |
| Volume Left | 11 | 0 | 53 |
| Volume Right | 32 | 5 | 0 |
| cSH | 804 | 1700 | 1467 |
| Volume to Capacity | 0.05 | 0.07 | 0.04 |
| Queue Length 95th (ft) | 4 | 0 | 3 |
| Control Delay (s) | 9.7 | 0.0 | 1.9 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.7 | 0.0 | 1.9 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 28.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 40 | 10 | 40 | 30 | 10 |
| Future Volume (Veh/h) | 20 | 40 | 10 | 40 | 30 | 10 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 21 | 42 | 11 | 42 | 32 | 11 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 107 | 32 | | | 53 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 107 | 32 | | | 53 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 98 | |
| cM capacity (veh/h) | 872 | 1042 | | | 1553 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 63 | 53 | 43 |
| Volume Left | 21 | 0 | 32 |
| Volume Right | 42 | 42 | 0 |
| cSH | 978 | 1700 | 1553 |
| Volume to Capacity | 0.06 | 0.03 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 2 |
| Control Delay (s) | 8.9 | 0.0 | 5.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.9 | 0.0 | 5.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 5.0 | | |
| Intersection Capacity Utilization | 19.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term Plus Project AM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 127 | 5 | 130 | 190 | 561 | 41 | 113 | 1470 | 260 |
| Future Volume (vph) | 70 | 0 | 10 | 127 | 5 | 130 | 190 | 561 | 41 | 113 | 1470 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 137 | 5 | 140 | 204 | 603 | 44 | 122 | 1581 | 280 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 123 | 0 | 0 | 0 | 23 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 137 | 22 | 0 | 204 | 603 | 21 | 122 | 1841 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.8 | 0.7 | 0.7 | 13.3 | 9.2 | | 8.6 | 35.1 | 35.1 | 7.8 | 34.3 | |
| Effective Green, g (s) | 4.8 | 0.7 | 0.7 | 13.3 | 9.2 | | 8.6 | 35.1 | 35.1 | 7.8 | 34.3 | |
| Actuated g/C Ratio | 0.06 | 0.01 | 0.01 | 0.18 | 0.12 | | 0.11 | 0.47 | 0.47 | 0.10 | 0.46 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 224 | 14 | 14 | 320 | 197 | | 402 | 1677 | 741 | 188 | 2324 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.08 | c0.01 | | 0.06 | 0.17 | | c0.07 | c0.36 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.01 | | | |
| v/c Ratio | 0.33 | 0.00 | 0.00 | 0.43 | 0.11 | | 0.51 | 0.36 | 0.03 | 0.65 | 0.79 | |
| Uniform Delay, d1 | 33.5 | 36.7 | 36.7 | 27.4 | 29.2 | | 31.1 | 12.7 | 10.7 | 32.2 | 17.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | 0.0 | 0.3 | 0.1 | | 0.4 | 0.1 | 0.0 | 5.7 | 1.9 | |
| Delay (s) | 33.8 | 36.7 | 36.7 | 27.7 | 29.3 | | 31.5 | 12.8 | 10.7 | 37.9 | 19.1 | |
| Level of Service | C | D | D | C | C | | C | B | B | D | B | |
| Approach Delay (s) | | 34.2 | | | 28.5 | | | 17.2 | | | 20.3 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.67 | | |
| Actuated Cycle Length (s) | 74.8 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 66.2% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 41 | 350 | 731 | 10 | 40 | 1317 | 250 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 41 | 350 | 731 | 10 | 40 | 1317 | 250 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1713 | | 3502 | 3574 | 1582 | 1805 | 5052 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1713 | | 3502 | 3574 | 1582 | 1805 | 5052 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 44 | 376 | 786 | 11 | 43 | 1416 | 269 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 83 | 0 | 0 | 0 | 4 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 376 | 786 | 7 | 43 | 1666 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 102 | | 91 | | 83 | | 553 | 2151 | 952 | 97 | 2516 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.22 | | 0.02 | c0.33 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.37 | 0.01 | 0.44 | 0.66 | |
| Uniform Delay, d1 | 34.2 | | 33.9 | | 34.4 | | 30.1 | 7.7 | 6.0 | 34.8 | 14.3 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.6 | 0.1 | 0.0 | 1.2 | 0.7 | |
| Delay (s) | 34.6 | | 34.0 | | 34.5 | | 32.8 | 7.8 | 6.0 | 36.0 | 14.9 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.1 | | | 34.5 | | | 15.8 | | | 15.5 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.59 | | |
| Actuated Cycle Length (s) | 75.9 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1071 | 11 | 0 | 1447 | 0 | 20 |
| Future Volume (Veh/h) | 1071 | 11 | 0 | 1447 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1152 | 12 | 0 | 1556 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.77 | |
| vC, conflicting volume | | | 1164 | | 1671 | 576 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1164 | | 835 | 576 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 95 |
| cM capacity (veh/h) | | | 596 | | 236 | 460 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 576 | 576 | 12 | 0 | 519 | 519 | 519 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 460 |
| Volume to Capacity | 0.34 | 0.34 | 0.01 | 0.00 | 0.31 | 0.31 | 0.31 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.2 |
| Lane LOS | | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 13.2 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 39.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 125 | 611 | 0 | 0 | 1083 | 365 | 20 | 0 | 472 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 125 | 611 | 0 | 0 | 1083 | 365 | 20 | 0 | 472 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 134 | 657 | 0 | 0 | 1165 | 392 | 22 | 0 | 508 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.77 | | | | | | 0.77 | 0.77 | | 0.77 | 0.77 | 0.77 |
| vC, conflicting volume | 1165 | | | 657 | | | 1508 | 2090 | 657 | 2090 | 2090 | 582 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 605 | | | 657 | | | 1052 | 1812 | 657 | 1812 | 1812 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 82 | | | 100 | | | 79 | 100 | 69 | 100 | 100 | 100 |
| cM capacity (veh/h) | 748 | | | 940 | | | 107 | 50 | 1655 | 23 | 50 | 836 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 134 | 657 | 582 | 582 | 392 | 22 | 508 |
| Volume Left | 134 | 0 | 0 | 0 | 0 | 22 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 392 | 0 | 508 |
| cSH | 748 | 1700 | 1700 | 1700 | 1700 | 107 | 1655 |
| Volume to Capacity | 0.18 | 0.39 | 0.34 | 0.34 | 0.23 | 0.21 | 0.31 |
| Queue Length 95th (ft) | 16 | 0 | 0 | 0 | 0 | 18 | 33 |
| Control Delay (s) | 10.9 | 0.0 | 0.0 | 0.0 | 0.0 | 47.2 | 8.1 |
| Lane LOS | B | | | | | E | A |
| Approach Delay (s) | 1.8 | | 0.0 | | | 9.8 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 68.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 143 | 315 | 440 | 663 | 421 | 131 |
| Future Volume (Veh/h) | 143 | 315 | 440 | 663 | 421 | 131 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 154 | 339 | 473 | 713 | 453 | 141 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 473 | | | | 1120 | 473 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 473 | | | | 1120 | 473 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 86 | | | | 0 | 76 |
| cM capacity (veh/h) | 1099 | | | | 190 | 595 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 493 | 473 | 713 | 453 | 141 |
| Volume Left | 154 | 0 | 0 | 453 | 0 |
| Volume Right | 0 | 0 | 713 | 0 | 141 |
| cSH | 1099 | 1700 | 1700 | 190 | 595 |
| Volume to Capacity | 0.14 | 0.28 | 0.42 | 2.38 | 0.24 |
| Queue Length 95th (ft) | 12 | 0 | 0 | 934 | 23 |
| Control Delay (s) | 3.8 | 0.0 | 0.0 | 675.9 | 12.9 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.8 | 0.0 | | 518.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 136.3 | | |
| Intersection Capacity Utilization | 81.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 80 | 64 | 1 | 160 | 97 | 2 |
| Future Volume (Veh/h) | 80 | 64 | 1 | 160 | 97 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 86 | 69 | 1 | 172 | 104 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 155 | | 296 | 122 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 155 | | 296 | 122 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 85 | 100 |
| cM capacity (veh/h) | | | 1425 | | 694 | 929 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 155 | 173 | 106 |
| Volume Left | 0 | 1 | 104 |
| Volume Right | 69 | 0 | 2 |
| cSH | 1700 | 1425 | 698 |
| Volume to Capacity | 0.09 | 0.00 | 0.15 |
| Queue Length 95th (ft) | 0 | 0 | 13 |
| Control Delay (s) | 0.0 | 0.0 | 11.1 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.1 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.7 | | |
| Intersection Capacity Utilization | 21.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 48 | 140 | 0 | 52 | 380 |
| Future Volume (Veh/h) | 10 | 48 | 140 | 0 | 52 | 380 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 11 | 52 | 151 | 0 | 56 | 409 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 672 | 151 | | | 151 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 672 | 151 | | | 151 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 94 | | | 96 | |
| cM capacity (veh/h) | 405 | 895 | | | 1430 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 63 | 151 | 465 |
| Volume Left | 11 | 0 | 56 |
| Volume Right | 52 | 0 | 0 |
| cSH | 739 | 1700 | 1430 |
| Volume to Capacity | 0.09 | 0.09 | 0.04 |
| Queue Length 95th (ft) | 7 | 0 | 3 |
| Control Delay (s) | 10.3 | 0.0 | 1.3 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.3 | 0.0 | 1.3 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.8 | | |
| Intersection Capacity Utilization | 43.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 30 | 2 | 2 | 47 |
| Future Volume (Veh/h) | 2 | 2 | 30 | 2 | 2 | 47 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 32 | 2 | 2 | 51 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 89 | 33 | | | 34 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 89 | 33 | | | 34 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 910 | 1041 | | | 1578 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 34 | 53 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 971 | 1700 | 1578 |
| Volume to Capacity | 0.00 | 0.02 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.7 | 0.0 | 0.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.7 | 0.0 | 0.3 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 14.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term Plus Project PM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 280 | 5 | 150 | 74 | 0 | 87 | 20 | 1461 | 75 | 122 | 500 | 60 |
| Future Volume (vph) | 280 | 5 | 150 | 74 | 0 | 87 | 20 | 1461 | 75 | 122 | 500 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 295 | 5 | 158 | 78 | 0 | 92 | 21 | 1538 | 79 | 128 | 526 | 63 |
| RTOR Reduction (vph) | 0 | 68 | 68 | 0 | 83 | 0 | 0 | 0 | 43 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 295 | 16 | 11 | 78 | 9 | 0 | 21 | 1538 | 36 | 128 | 579 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.1 | 12.3 | 12.3 | 7.0 | 8.2 | | 1.9 | 39.6 | 39.6 | 10.6 | 48.3 | |
| Effective Green, g (s) | 11.1 | 12.3 | 12.3 | 7.0 | 8.2 | | 1.9 | 39.6 | 39.6 | 10.6 | 48.3 | |
| Actuated g/C Ratio | 0.13 | 0.14 | 0.14 | 0.08 | 0.09 | | 0.02 | 0.45 | 0.45 | 0.12 | 0.55 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 444 | 218 | 215 | 144 | 151 | | 76 | 1635 | 713 | 218 | 2791 | |
| v/s Ratio Prot | c0.08 | c0.01 | | 0.04 | 0.01 | | 0.01 | c0.43 | | c0.07 | 0.11 | |
| v/s Ratio Perm | | | 0.01 | | | | | | 0.02 | | | |
| v/c Ratio | 0.66 | 0.07 | 0.05 | 0.54 | 0.06 | | 0.28 | 0.94 | 0.05 | 0.59 | 0.21 | |
| Uniform Delay, d1 | 36.4 | 32.6 | 32.5 | 38.7 | 36.1 | | 42.1 | 22.8 | 13.4 | 36.3 | 9.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.9 | 0.1 | 0.0 | 2.2 | 0.1 | | 0.7 | 11.1 | 0.0 | 2.6 | 0.0 | |
| Delay (s) | 39.3 | 32.7 | 32.5 | 40.9 | 36.1 | | 42.8 | 33.9 | 13.4 | 38.9 | 9.9 | |
| Level of Service | D | C | C | D | D | | D | C | B | D | A | |
| Approach Delay (s) | | 36.9 | | | 38.3 | | | 33.0 | | | 15.1 | |
| Approach LOS | | D | | | D | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 29.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 87.4 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 73.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 150 | 0 | 360 | 20 | 0 | 41 | 60 | 1365 | 30 | 40 | 664 | 20 |
| Future Volume (vph) | 150 | 0 | 360 | 20 | 0 | 41 | 60 | 1365 | 30 | 40 | 664 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1700 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1700 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 158 | 0 | 379 | 21 | 0 | 43 | 63 | 1437 | 32 | 42 | 699 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 324 | 0 | 61 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 158 | 0 | 55 | 0 | 3 | 0 | 63 | 1437 | 16 | 42 | 718 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.5 | | 10.5 | | 3.8 | | 3.4 | 36.0 | 36.0 | 3.8 | 36.4 | |
| Effective Green, g (s) | 10.5 | | 10.5 | | 3.8 | | 3.4 | 36.0 | 36.0 | 3.8 | 36.4 | |
| Actuated g/C Ratio | 0.15 | | 0.15 | | 0.05 | | 0.05 | 0.50 | 0.50 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 262 | | 234 | | 89 | | 164 | 1800 | 786 | 95 | 2577 | |
| v/s Ratio Prot | c0.09 | | | | c0.00 | | 0.02 | c0.40 | | c0.02 | 0.14 | |
| v/s Ratio Perm | | | 0.03 | | | | | | 0.01 | | | |
| v/c Ratio | 0.60 | | 0.24 | | 0.04 | | 0.38 | 0.80 | 0.02 | 0.44 | 0.28 | |
| Uniform Delay, d1 | 28.9 | | 27.3 | | 32.5 | | 33.4 | 15.1 | 9.2 | 33.2 | 10.3 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.7 | | 0.2 | | 0.1 | | 0.5 | 2.6 | 0.0 | 1.2 | 0.1 | |
| Delay (s) | 31.6 | | 27.5 | | 32.5 | | 33.9 | 17.6 | 9.2 | 34.4 | 10.4 | |
| Level of Service | C | | C | | C | | C | B | A | C | B | |
| Approach Delay (s) | | 28.7 | | | 32.5 | | | 18.1 | | | 11.7 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 18.7 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 72.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 61.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1435 | 23 | 30 | 1014 | 0 | 20 |
| Future Volume (Veh/h) | 1435 | 23 | 30 | 1014 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1511 | 24 | 32 | 1067 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.94 | |
| vC, conflicting volume | | | 1535 | | 1931 | 756 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1535 | | 1767 | 756 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 93 | | 100 | 94 |
| cM capacity (veh/h) | | | 429 | | 65 | 351 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 756 | 756 | 24 | 32 | 356 | 356 | 356 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 429 | 1700 | 1700 | 1700 | 351 |
| Volume to Capacity | 0.44 | 0.44 | 0.01 | 0.07 | 0.21 | 0.21 | 0.21 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.1 | 0.0 | 0.0 | 0.0 | 15.9 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.4 | | | | 15.9 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 49.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 333 | 704 | 0 | 0 | 432 | 583 | 21 | 0 | 755 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 333 | 704 | 0 | 0 | 432 | 583 | 21 | 0 | 755 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 351 | 741 | 0 | 0 | 455 | 614 | 22 | 0 | 795 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 455 | | | 741 | | | 1670 | 1898 | 741 | 1898 | 1898 | 228 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 455 | | | 741 | | | 1670 | 1898 | 741 | 1898 | 1898 | 228 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 69 | | | 100 | | | 55 | 100 | 52 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1116 | | | 875 | | | 48 | 48 | 1656 | 17 | 48 | 781 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 351 | 741 | 228 | 228 | 614 | 22 | 795 |
| Volume Left | 351 | 0 | 0 | 0 | 0 | 22 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 614 | 0 | 795 |
| cSH | 1116 | 1700 | 1700 | 1700 | 1700 | 48 | 1656 |
| Volume to Capacity | 0.31 | 0.44 | 0.13 | 0.13 | 0.36 | 0.45 | 0.48 |
| Queue Length 95th (ft) | 34 | 0 | 0 | 0 | 0 | 42 | 68 |
| Control Delay (s) | 9.7 | 0.0 | 0.0 | 0.0 | 0.0 | 130.4 | 9.2 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.1 | | 0.0 | | | 12.4 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.6 | | |
| Intersection Capacity Utilization | 90.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 32 | 783 | 191 | 262 | 254 | 165 |
| Future Volume (Veh/h) | 32 | 783 | 191 | 262 | 254 | 165 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 34 | 824 | 201 | 276 | 267 | 174 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 201 | | | | 1093 | 201 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 201 | | | | 1093 | 201 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 0 | 79 |
| cM capacity (veh/h) | 1383 | | | | 232 | 845 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 858 | 201 | 276 | 267 | 174 |
| Volume Left | 34 | 0 | 0 | 267 | 0 |
| Volume Right | 0 | 0 | 276 | 0 | 174 |
| cSH | 1383 | 1700 | 1700 | 232 | 845 |
| Volume to Capacity | 0.02 | 0.12 | 0.16 | 1.15 | 0.21 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 310 | 19 |
| Control Delay (s) | 0.7 | 0.0 | 0.0 | 149.7 | 10.4 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.7 | 0.0 | | 94.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 23.8 | | |
| Intersection Capacity Utilization | 77.1% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 100 | 87 | 1 | 80 | 71 | 0 |
| Future Volume (Veh/h) | 100 | 87 | 1 | 80 | 71 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 105 | 92 | 1 | 84 | 75 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 197 | | 237 | 151 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 197 | | 237 | 151 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 90 | 100 |
| cM capacity (veh/h) | | | 1376 | | 751 | 895 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 197 | 85 | 75 |
| Volume Left | 0 | 1 | 75 |
| Volume Right | 92 | 0 | 0 |
| cSH | 1700 | 1376 | 751 |
| Volume to Capacity | 0.12 | 0.00 | 0.10 |
| Queue Length 95th (ft) | 0 | 0 | 8 |
| Control Delay (s) | 0.0 | 0.1 | 10.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 21.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 35 | 110 | 5 | 58 | 180 |
| Future Volume (Veh/h) | 10 | 35 | 110 | 5 | 58 | 180 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 37 | 116 | 5 | 61 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 430 | 118 | | | 121 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 430 | 118 | | | 121 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 96 | |
| cM capacity (veh/h) | 558 | 933 | | | 1467 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 48 | 121 | 250 |
| Volume Left | 11 | 0 | 61 |
| Volume Right | 37 | 5 | 0 |
| cSH | 809 | 1700 | 1467 |
| Volume to Capacity | 0.06 | 0.07 | 0.04 |
| Queue Length 95th (ft) | 5 | 0 | 3 |
| Control Delay (s) | 9.7 | 0.0 | 2.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.7 | 0.0 | 2.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.4 | | |
| Intersection Capacity Utilization | 29.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 59 | 2 | 2 | 29 |
| Future Volume (Veh/h) | 2 | 2 | 59 | 2 | 2 | 29 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 62 | 2 | 2 | 31 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 98 | 63 | | | 64 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 98 | 63 | | | 64 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 900 | 1002 | | | 1538 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 64 | 33 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 948 | 1700 | 1538 |
| Volume to Capacity | 0.00 | 0.04 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.8 | 0.0 | 0.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.8 | 0.0 | 0.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term AM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 148 | 5 | 120 | 190 | 560 | 58 | 110 | 1470 | 260 |
| Future Volume (vph) | 70 | 0 | 10 | 148 | 5 | 120 | 190 | 560 | 58 | 110 | 1470 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1610 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1610 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 159 | 5 | 129 | 204 | 602 | 62 | 118 | 1581 | 280 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 113 | 0 | 0 | 0 | 33 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 159 | 21 | 0 | 204 | 602 | 29 | 118 | 1841 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.8 | 0.7 | 0.7 | 13.7 | 9.6 | | 8.7 | 35.4 | 35.4 | 7.7 | 34.4 | |
| Effective Green, g (s) | 4.8 | 0.7 | 0.7 | 13.7 | 9.6 | | 8.7 | 35.4 | 35.4 | 7.7 | 34.4 | |
| Actuated g/C Ratio | 0.06 | 0.01 | 0.01 | 0.18 | 0.13 | | 0.12 | 0.47 | 0.47 | 0.10 | 0.46 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 222 | 14 | 14 | 327 | 204 | | 404 | 1677 | 742 | 184 | 2313 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.09 | c0.01 | | 0.06 | 0.17 | | c0.07 | c0.36 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.34 | 0.00 | 0.00 | 0.49 | 0.11 | | 0.50 | 0.36 | 0.04 | 0.64 | 0.80 | |
| Uniform Delay, d1 | 33.8 | 37.0 | 37.0 | 27.7 | 29.1 | | 31.3 | 12.8 | 10.8 | 32.5 | 17.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | 0.0 | 0.4 | 0.1 | | 0.4 | 0.1 | 0.0 | 5.6 | 2.0 | |
| Delay (s) | 34.1 | 37.0 | 37.0 | 28.1 | 29.2 | | 31.7 | 12.9 | 10.8 | 38.1 | 19.5 | |
| Level of Service | C | D | D | C | C | | C | B | B | D | B | |
| Approach Delay (s) | | 34.5 | | | 28.6 | | | 17.2 | | | 20.6 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.8 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.68 | | |
| Actuated Cycle Length (s) | 75.4 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 66.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 748 | 10 | 40 | 1338 | 250 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 748 | 10 | 40 | 1338 | 250 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5054 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5054 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 376 | 804 | 11 | 43 | 1439 | 269 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 376 | 804 | 7 | 43 | 1690 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 102 | | 91 | | 83 | | 553 | 2151 | 952 | 97 | 2517 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.22 | | 0.02 | c0.33 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.37 | 0.01 | 0.44 | 0.67 | |
| Uniform Delay, d1 | 34.2 | | 33.9 | | 34.4 | | 30.1 | 7.8 | 6.0 | 34.8 | 14.4 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.6 | 0.1 | 0.0 | 1.2 | 0.7 | |
| Delay (s) | 34.6 | | 34.0 | | 34.5 | | 32.8 | 7.9 | 6.0 | 36.0 | 15.1 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.1 | | | 34.5 | | | 15.7 | | | 15.6 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 75.9 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 65.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1088 | 10 | 0 | 1468 | 0 | 20 |
| Future Volume (Veh/h) | 1088 | 10 | 0 | 1468 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1170 | 11 | 0 | 1578 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.77 | |
| vC, conflicting volume | | | 1181 | | 1696 | 585 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1181 | | 841 | 585 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 95 |
| cM capacity (veh/h) | | | 587 | | 233 | 454 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 585 | 585 | 11 | 0 | 526 | 526 | 526 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 454 |
| Volume to Capacity | 0.34 | 0.34 | 0.01 | 0.00 | 0.31 | 0.31 | 0.31 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 13.3 |
| Lane LOS | | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 13.3 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 40.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 619 | 0 | 0 | 1094 | 374 | 16 | 0 | 479 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 106 | 619 | 0 | 0 | 1094 | 374 | 16 | 0 | 479 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 114 | 666 | 0 | 0 | 1176 | 402 | 17 | 0 | 515 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.76 | | | | | | 0.76 | 0.76 | | 0.76 | 0.76 | 0.76 |
| vC, conflicting volume | 1176 | | | 666 | | | 1482 | 2070 | 666 | 2070 | 2070 | 588 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 602 | | | 666 | | | 1004 | 1777 | 666 | 1777 | 1777 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 85 | | | 100 | | | 86 | 100 | 69 | 100 | 100 | 100 |
| cM capacity (veh/h) | 744 | | | 933 | | | 118 | 54 | 1655 | 25 | 54 | 830 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 114 | 666 | 588 | 588 | 402 | 17 | 515 |
| Volume Left | 114 | 0 | 0 | 0 | 0 | 17 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 402 | 0 | 515 |
| cSH | 744 | 1700 | 1700 | 1700 | 1700 | 118 | 1655 |
| Volume to Capacity | 0.15 | 0.39 | 0.35 | 0.35 | 0.24 | 0.14 | 0.31 |
| Queue Length 95th (ft) | 13 | 0 | 0 | 0 | 0 | 12 | 34 |
| Control Delay (s) | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 | 40.5 | 8.2 |
| Lane LOS | B | | | | | E | A |
| Approach Delay (s) | 1.6 | | 0.0 | | | 9.2 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 68.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 126 | 296 | 436 | 674 | 429 | 116 |
| Future Volume (Veh/h) | 126 | 296 | 436 | 674 | 429 | 116 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 135 | 318 | 469 | 725 | 461 | 125 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 469 | | | | 1057 | 469 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 469 | | | | 1057 | 469 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 0 | 79 |
| cM capacity (veh/h) | 1103 | | | | 212 | 598 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 453 | 469 | 725 | 461 | 125 |
| Volume Left | 135 | 0 | 0 | 461 | 0 |
| Volume Right | 0 | 0 | 725 | 0 | 125 |
| cSH | 1103 | 1700 | 1700 | 212 | 598 |
| Volume to Capacity | 0.12 | 0.28 | 0.43 | 2.17 | 0.21 |
| Queue Length 95th (ft) | 10 | 0 | 0 | 898 | 20 |
| Control Delay (s) | 3.5 | 0.0 | 0.0 | 579.8 | 12.6 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.5 | 0.0 | | 458.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 121.1 | | |
| Intersection Capacity Utilization | 79.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 116 | 42 | 1 | 216 | 52 | 2 |
| Future Volume (Veh/h) | 116 | 42 | 1 | 216 | 52 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 125 | 45 | 1 | 232 | 56 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 170 | | 382 | 148 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 170 | | 382 | 148 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 91 | 100 |
| cM capacity (veh/h) | | | 1407 | | 619 | 897 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 170 | 233 | 58 |
| Volume Left | 0 | 1 | 56 |
| Volume Right | 45 | 0 | 2 |
| cSH | 1700 | 1407 | 626 |
| Volume to Capacity | 0.10 | 0.00 | 0.09 |
| Queue Length 95th (ft) | 0 | 0 | 8 |
| Control Delay (s) | 0.0 | 0.0 | 11.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.4 | | |
| Intersection Capacity Utilization | 22.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 12 | 140 | 0 | 32 | 380 |
| Future Volume (Veh/h) | 10 | 12 | 140 | 0 | 32 | 380 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 11 | 13 | 151 | 0 | 34 | 409 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 628 | 151 | | | 151 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 628 | 151 | | | 151 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 99 | | | 98 | |
| cM capacity (veh/h) | 436 | 895 | | | 1430 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 24 | 151 | 443 |
| Volume Left | 11 | 0 | 34 |
| Volume Right | 13 | 0 | 0 |
| cSH | 604 | 1700 | 1430 |
| Volume to Capacity | 0.04 | 0.09 | 0.02 |
| Queue Length 95th (ft) | 3 | 0 | 2 |
| Control Delay (s) | 11.2 | 0.0 | 0.8 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.2 | 0.0 | 0.8 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 42.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Future Volume (Veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 11 | 2 | 2 | 11 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 28 | 12 | | | 13 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 28 | 12 | | | 13 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 985 | 1069 | | | 1606 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 13 | 13 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1025 | 1700 | 1606 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 1.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 1.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 280 | 5 | 150 | 88 | 0 | 80 | 20 | 1460 | 108 | 110 | 500 | 60 |
| Future Volume (vph) | 280 | 5 | 150 | 88 | 0 | 80 | 20 | 1460 | 108 | 110 | 500 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 295 | 5 | 158 | 93 | 0 | 84 | 21 | 1537 | 114 | 116 | 526 | 63 |
| RTOR Reduction (vph) | 0 | 71 | 71 | 0 | 80 | 0 | 0 | 0 | 59 | 0 | 10 | 0 |
| Lane Group Flow (vph) | 295 | 13 | 8 | 93 | 4 | 0 | 21 | 1537 | 55 | 116 | 579 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.9 | 7.8 | 7.8 | 7.0 | 3.9 | | 1.9 | 37.8 | 37.8 | 7.8 | 43.7 | |
| Effective Green, g (s) | 10.9 | 7.8 | 7.8 | 7.0 | 3.9 | | 1.9 | 37.8 | 37.8 | 7.8 | 43.7 | |
| Actuated g/C Ratio | 0.14 | 0.10 | 0.10 | 0.09 | 0.05 | | 0.02 | 0.48 | 0.48 | 0.10 | 0.56 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 487 | 154 | 152 | 161 | 80 | | 84 | 1742 | 760 | 179 | 2819 | |
| v/s Ratio Prot | c0.08 | c0.01 | | 0.05 | 0.00 | | 0.01 | c0.43 | | c0.06 | 0.11 | |
| v/s Ratio Perm | | | 0.01 | | | | | | 0.03 | | | |
| v/c Ratio | 0.61 | 0.08 | 0.05 | 0.58 | 0.05 | | 0.25 | 0.88 | 0.07 | 0.65 | 0.21 | |
| Uniform Delay, d1 | 31.7 | 32.0 | 31.9 | 34.2 | 35.4 | | 37.5 | 18.2 | 10.9 | 33.9 | 8.6 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.5 | 0.1 | 0.1 | 3.1 | 0.1 | | 0.6 | 5.7 | 0.0 | 5.9 | 0.0 | |
| Delay (s) | 33.1 | 32.1 | 32.0 | 37.3 | 35.5 | | 38.1 | 23.9 | 10.9 | 39.9 | 8.7 | |
| Level of Service | C | C | C | D | D | | D | C | B | D | A | |
| Approach Delay (s) | | 32.7 | | | 36.5 | | | 23.2 | | | 13.8 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 23.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 78.3 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 72.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1398 | 30 | 40 | 678 | 20 |
| Future Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1398 | 30 | 40 | 678 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 158 | 0 | 379 | 21 | 0 | 42 | 63 | 1472 | 32 | 42 | 714 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 323 | 0 | 61 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 158 | 0 | 56 | 0 | 2 | 0 | 63 | 1472 | 16 | 42 | 733 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Effective Green, g (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Actuated g/C Ratio | 0.15 | | 0.15 | | 0.04 | | 0.05 | 0.51 | 0.51 | 0.05 | 0.51 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 268 | | 240 | | 62 | | 162 | 1837 | 803 | 93 | 2631 | |
| v/s Ratio Prot | c0.09 | | | | c0.00 | | 0.02 | c0.41 | | c0.02 | 0.14 | |
| v/s Ratio Perm | | | 0.03 | | | | | | 0.01 | | | |
| v/c Ratio | 0.59 | | 0.23 | | 0.04 | | 0.39 | 0.80 | 0.02 | 0.45 | 0.28 | |
| Uniform Delay, d1 | 28.3 | | 26.8 | | 33.1 | | 33.0 | 14.5 | 8.7 | 32.8 | 9.8 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.1 | | 0.2 | | 0.1 | | 0.6 | 2.6 | 0.0 | 1.3 | 0.1 | |
| Delay (s) | 30.5 | | 27.0 | | 33.2 | | 33.6 | 17.1 | 8.7 | 34.1 | 9.9 | |
| Level of Service | C | | C | | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.0 | | | 33.2 | | | 17.6 | | | 11.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 18.1 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 71.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 61.9% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1468 | 20 | 30 | 1028 | 0 | 20 |
| Future Volume (Veh/h) | 1468 | 20 | 30 | 1028 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1545 | 21 | 32 | 1082 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.94 | |
| vC, conflicting volume | | | 1566 | | 1970 | 772 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1566 | | 1806 | 772 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 418 | | 61 | 342 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 772 | 772 | 21 | 32 | 361 | 361 | 361 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 418 | 1700 | 1700 | 1700 | 342 |
| Volume to Capacity | 0.45 | 0.45 | 0.01 | 0.08 | 0.21 | 0.21 | 0.21 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.3 | 0.0 | 0.0 | 0.0 | 16.2 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.4 | | | | 16.2 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 50.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 316 | 713 | 0 | 0 | 438 | 590 | 12 | 0 | 775 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 316 | 713 | 0 | 0 | 438 | 590 | 12 | 0 | 775 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 333 | 751 | 0 | 0 | 461 | 621 | 13 | 0 | 816 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 461 | | | 751 | | | 1648 | 1878 | 751 | 1878 | 1878 | 230 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 461 | | | 751 | | | 1648 | 1878 | 751 | 1878 | 1878 | 230 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 70 | | | 100 | | | 75 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1111 | | | 868 | | | 51 | 51 | 1656 | 17 | 51 | 778 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 333 | 751 | 230 | 230 | 621 | 13 | 816 |
| Volume Left | 333 | 0 | 0 | 0 | 0 | 13 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 621 | 0 | 816 |
| cSH | 1111 | 1700 | 1700 | 1700 | 1700 | 51 | 1656 |
| Volume to Capacity | 0.30 | 0.44 | 0.14 | 0.14 | 0.37 | 0.25 | 0.49 |
| Queue Length 95th (ft) | 32 | 0 | 0 | 0 | 0 | 22 | 71 |
| Control Delay (s) | 9.6 | 0.0 | 0.0 | 0.0 | 0.0 | 97.7 | 9.3 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 3.0 | | 0.0 | | | 10.7 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.0 | | |
| Intersection Capacity Utilization | 92.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 766 | 182 | 268 | 263 | 130 |
| Future Volume (Veh/h) | 26 | 766 | 182 | 268 | 263 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 27 | 806 | 192 | 282 | 277 | 137 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 192 | | | | 1052 | 192 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 192 | | | | 1052 | 192 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 0 | 84 |
| cM capacity (veh/h) | 1394 | | | | 247 | 855 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 833 | 192 | 282 | 277 | 137 |
| Volume Left | 27 | 0 | 0 | 277 | 0 |
| Volume Right | 0 | 0 | 282 | 0 | 137 |
| cSH | 1394 | 1700 | 1700 | 247 | 855 |
| Volume to Capacity | 0.02 | 0.11 | 0.17 | 1.12 | 0.16 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 306 | 14 |
| Control Delay (s) | 0.5 | 0.0 | 0.0 | 136.7 | 10.0 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.5 | 0.0 | | 94.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 23.0 | | |
| Intersection Capacity Utilization | 75.9% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 166 | 42 | 1 | 136 | 22 | 0 |
| Future Volume (Veh/h) | 166 | 42 | 1 | 136 | 22 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 175 | 44 | 1 | 143 | 23 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 219 | | 342 | 197 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 219 | | 342 | 197 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 96 | 100 |
| cM capacity (veh/h) | | | 1350 | | 654 | 844 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 219 | 144 | 23 |
| Volume Left | 0 | 1 | 23 |
| Volume Right | 44 | 0 | 0 |
| cSH | 1700 | 1350 | 654 |
| Volume to Capacity | 0.13 | 0.00 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.1 | 10.7 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.7 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 21.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 12 | 110 | 5 | 12 | 180 |
| Future Volume (Veh/h) | 10 | 12 | 110 | 5 | 12 | 180 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 13 | 116 | 5 | 13 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 334 | 118 | | | 121 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 334 | 118 | | | 121 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 99 | |
| cM capacity (veh/h) | 656 | 933 | | | 1467 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 24 | 121 | 202 |
| Volume Left | 11 | 0 | 13 |
| Volume Right | 13 | 5 | 0 |
| cSH | 782 | 1700 | 1467 |
| Volume to Capacity | 0.03 | 0.07 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 9.8 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.8 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 26.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 10 | 2 | 2 | 5 |
| Future Volume (Veh/h) | 2 | 2 | 10 | 2 | 2 | 5 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 11 | 2 | 2 | 5 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 21 | 12 | | | 13 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 21 | 12 | | | 13 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 995 | 1069 | | | 1606 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 13 | 7 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1030 | 1700 | 1606 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 2.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 2.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term Plus Project AM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 163 | 5 | 131 | 190 | 560 | 62 | 113 | 1470 | 260 |
| Future Volume (vph) | 70 | 0 | 10 | 163 | 5 | 131 | 190 | 560 | 62 | 113 | 1470 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.86 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5070 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 175 | 5 | 141 | 204 | 602 | 67 | 122 | 1581 | 280 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 123 | 0 | 0 | 0 | 36 | 0 | 20 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 175 | 23 | 0 | 204 | 602 | 31 | 122 | 1841 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.8 | 0.7 | 0.7 | 14.0 | 9.9 | | 8.7 | 35.3 | 35.3 | 7.9 | 34.5 | |
| Effective Green, g (s) | 4.8 | 0.7 | 0.7 | 14.0 | 9.9 | | 8.7 | 35.3 | 35.3 | 7.9 | 34.5 | |
| Actuated g/C Ratio | 0.06 | 0.01 | 0.01 | 0.18 | 0.13 | | 0.11 | 0.47 | 0.47 | 0.10 | 0.46 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 221 | 14 | 14 | 333 | 210 | | 401 | 1664 | 736 | 188 | 2307 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.10 | c0.01 | | 0.06 | 0.17 | | c0.07 | c0.36 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.34 | 0.00 | 0.00 | 0.53 | 0.11 | | 0.51 | 0.36 | 0.04 | 0.65 | 0.80 | |
| Uniform Delay, d1 | 34.0 | 37.2 | 37.2 | 27.9 | 29.1 | | 31.5 | 13.0 | 11.0 | 32.6 | 17.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.3 | 0.0 | 0.0 | 0.7 | 0.1 | | 0.4 | 0.1 | 0.0 | 5.7 | 2.0 | |
| Delay (s) | 34.3 | 37.2 | 37.2 | 28.6 | 29.2 | | 31.9 | 13.1 | 11.1 | 38.3 | 19.7 | |
| Level of Service | C | D | D | C | C | | C | B | B | D | B | |
| Approach Delay (s) | | 34.7 | | | 28.8 | | | 17.4 | | | 20.8 | |
| Approach LOS | | C | | | C | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 21.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 75.8 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 66.9% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 752 | 10 | 40 | 1353 | 250 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 350 | 752 | 10 | 40 | 1353 | 250 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5055 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5055 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 376 | 809 | 11 | 43 | 1455 | 269 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 376 | 809 | 7 | 43 | 1706 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.0 | 45.7 | 45.7 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 102 | | 91 | | 83 | | 553 | 2151 | 952 | 97 | 2517 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.23 | | 0.02 | c0.34 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.38 | 0.01 | 0.44 | 0.68 | |
| Uniform Delay, d1 | 34.2 | | 33.9 | | 34.4 | | 30.1 | 7.8 | 6.0 | 34.8 | 14.4 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.6 | 0.1 | 0.0 | 1.2 | 0.7 | |
| Delay (s) | 34.6 | | 34.0 | | 34.5 | | 32.8 | 7.9 | 6.0 | 36.0 | 15.2 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.1 | | | 34.5 | | | 15.7 | | | 15.7 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.9 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 75.9 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 65.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1092 | 10 | 0 | 1483 | 0 | 20 |
| Future Volume (Veh/h) | 1092 | 10 | 0 | 1483 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1174 | 11 | 0 | 1595 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.76 | |
| vC, conflicting volume | | | 1185 | | 1711 | 397 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1185 | | 842 | 397 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 96 |
| cM capacity (veh/h) | | | 585 | | 231 | 603 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 470 | 470 | 246 | 0 | 532 | 532 | 532 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 603 |
| Volume to Capacity | 0.28 | 0.28 | 0.14 | 0.00 | 0.31 | 0.31 | 0.31 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.2 |
| Lane LOS | | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 11.2 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 32.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 106 | 621 | 0 | 0 | 1100 | 383 | 16 | 0 | 481 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 106 | 621 | 0 | 0 | 1100 | 383 | 16 | 0 | 481 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 114 | 668 | 0 | 0 | 1183 | 412 | 17 | 0 | 517 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.76 | | | | | | 0.76 | 0.76 | | 0.76 | 0.76 | 0.76 |
| vC, conflicting volume | 1183 | | | 668 | | | 1488 | 2079 | 668 | 2079 | 2079 | 592 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 600 | | | 668 | | | 1003 | 1784 | 668 | 1784 | 1784 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 85 | | | 100 | | | 86 | 100 | 69 | 100 | 100 | 100 |
| cM capacity (veh/h) | 742 | | | 931 | | | 118 | 53 | 1655 | 24 | 53 | 826 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 114 | 668 | 592 | 592 | 412 | 17 | 517 |
| Volume Left | 114 | 0 | 0 | 0 | 0 | 17 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 412 | 0 | 517 |
| cSH | 742 | 1700 | 1700 | 1700 | 1700 | 118 | 1655 |
| Volume to Capacity | 0.15 | 0.39 | 0.35 | 0.35 | 0.24 | 0.14 | 0.31 |
| Queue Length 95th (ft) | 14 | 0 | 0 | 0 | 0 | 12 | 34 |
| Control Delay (s) | 10.7 | 0.0 | 0.0 | 0.0 | 0.0 | 40.6 | 8.2 |
| Lane LOS | B | | | | | E | A |
| Approach Delay (s) | 1.6 | | 0.0 | | | 9.2 | |
| Approach LOS | | | | | | A | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 69.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 126 | 296 | 437 | 679 | 431 | 116 |
| Future Volume (Veh/h) | 126 | 296 | 437 | 679 | 431 | 116 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 135 | 318 | 470 | 730 | 463 | 125 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 470 | | | | 1058 | 470 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 470 | | | | 1058 | 470 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 0 | 79 |
| cM capacity (veh/h) | 1102 | | | | 212 | 598 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 453 | 470 | 730 | 463 | 125 |
| Volume Left | 135 | 0 | 0 | 463 | 0 |
| Volume Right | 0 | 0 | 730 | 0 | 125 |
| cSH | 1102 | 1700 | 1700 | 212 | 598 |
| Volume to Capacity | 0.12 | 0.28 | 0.43 | 2.19 | 0.21 |
| Queue Length 95th (ft) | 10 | 0 | 0 | 905 | 20 |
| Control Delay (s) | 3.5 | 0.0 | 0.0 | 585.5 | 12.6 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.5 | 0.0 | | 463.7 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 122.4 | | |
| Intersection Capacity Utilization | 79.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 123 | 42 | 1 | 242 | 52 | 2 |
| Future Volume (Veh/h) | 123 | 42 | 1 | 242 | 52 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 132 | 45 | 1 | 260 | 56 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 177 | | 418 | 156 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 177 | | 418 | 156 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 91 | 100 |
| cM capacity (veh/h) | | | 1399 | | 591 | 889 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 177 | 261 | 58 |
| Volume Left | 0 | 1 | 56 |
| Volume Right | 45 | 0 | 2 |
| cSH | 1700 | 1399 | 598 |
| Volume to Capacity | 0.10 | 0.00 | 0.10 |
| Queue Length 95th (ft) | 0 | 0 | 8 |
| Control Delay (s) | 0.0 | 0.0 | 11.7 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.7 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.4 | | |
| Intersection Capacity Utilization | 23.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 12 | 140 | 0 | 32 | 380 |
| Future Volume (Veh/h) | 10 | 12 | 140 | 0 | 32 | 380 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 11 | 13 | 151 | 0 | 34 | 409 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 628 | 151 | | | 151 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 628 | 151 | | | 151 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 99 | | | 98 | |
| cM capacity (veh/h) | 436 | 895 | | | 1430 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 24 | 151 | 443 |
| Volume Left | 11 | 0 | 34 |
| Volume Right | 13 | 0 | 0 |
| cSH | 604 | 1700 | 1430 |
| Volume to Capacity | 0.04 | 0.09 | 0.02 |
| Queue Length 95th (ft) | 3 | 0 | 2 |
| Control Delay (s) | 11.2 | 0.0 | 0.8 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.2 | 0.0 | 0.8 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 42.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Future Volume (Veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 11 | 2 | 2 | 11 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 28 | 12 | | | 13 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 28 | 12 | | | 13 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 985 | 1069 | | | 1606 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 13 | 13 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1025 | 1700 | 1606 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 1.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 1.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Near Term Plus Project PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 280 | 5 | 150 | 97 | 0 | 87 | 20 | 1460 | 124 | 122 | 500 | 60 |
| Future Volume (vph) | 280 | 5 | 150 | 97 | 0 | 87 | 20 | 1460 | 124 | 122 | 500 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5051 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 295 | 5 | 158 | 102 | 0 | 92 | 21 | 1537 | 131 | 128 | 526 | 63 |
| RTOR Reduction (vph) | 0 | 72 | 72 | 0 | 87 | 0 | 0 | 0 | 70 | 0 | 9 | 0 |
| Lane Group Flow (vph) | 295 | 12 | 7 | 102 | 5 | 0 | 21 | 1537 | 61 | 128 | 580 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.9 | 7.5 | 7.5 | 7.6 | 4.2 | | 2.0 | 38.1 | 38.1 | 10.1 | 46.2 | |
| Effective Green, g (s) | 10.9 | 7.5 | 7.5 | 7.6 | 4.2 | | 2.0 | 38.1 | 38.1 | 10.1 | 46.2 | |
| Actuated g/C Ratio | 0.13 | 0.09 | 0.09 | 0.09 | 0.05 | | 0.02 | 0.47 | 0.47 | 0.12 | 0.57 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 470 | 143 | 141 | 168 | 83 | | 86 | 1693 | 739 | 224 | 2873 | |
| v/s Ratio Prot | c0.08 | c0.01 | | 0.06 | 0.00 | | 0.01 | c0.43 | | c0.07 | 0.11 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.04 | | | |
| v/c Ratio | 0.63 | 0.09 | 0.05 | 0.61 | 0.06 | | 0.24 | 0.91 | 0.08 | 0.57 | 0.20 | |
| Uniform Delay, d1 | 33.2 | 33.7 | 33.6 | 35.4 | 36.6 | | 38.9 | 19.9 | 11.9 | 33.5 | 8.5 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 1.9 | 0.1 | 0.1 | 4.2 | 0.1 | | 0.5 | 7.5 | 0.0 | 2.2 | 0.0 | |
| Delay (s) | 35.1 | 33.8 | 33.7 | 39.6 | 36.7 | | 39.4 | 27.4 | 12.0 | 35.7 | 8.6 | |
| Level of Service | D | C | C | D | D | | D | C | B | D | A | |
| Approach Delay (s) | | 34.6 | | | 38.2 | | | 26.3 | | | 13.4 | |
| Approach LOS | | C | | | D | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 25.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.74 | | |
| Actuated Cycle Length (s) | 81.2 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 73.4% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1414 | 30 | 40 | 687 | 20 |
| Future Volume (vph) | 150 | 0 | 360 | 20 | 0 | 40 | 60 | 1414 | 30 | 40 | 687 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5113 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 158 | 0 | 379 | 21 | 0 | 42 | 63 | 1488 | 32 | 42 | 723 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 323 | 0 | 61 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 158 | 0 | 56 | 0 | 2 | 0 | 63 | 1488 | 16 | 42 | 742 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Effective Green, g (s) | 10.6 | | 10.6 | | 2.6 | | 3.3 | 36.3 | 36.3 | 3.7 | 36.7 | |
| Actuated g/C Ratio | 0.15 | | 0.15 | | 0.04 | | 0.05 | 0.51 | 0.51 | 0.05 | 0.51 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 268 | | 240 | | 62 | | 162 | 1837 | 803 | 93 | 2631 | |
| v/s Ratio Prot | c0.09 | | | | c0.00 | | 0.02 | c0.41 | | c0.02 | 0.15 | |
| v/s Ratio Perm | | | 0.03 | | | | | | 0.01 | | | |
| v/c Ratio | 0.59 | | 0.23 | | 0.04 | | 0.39 | 0.81 | 0.02 | 0.45 | 0.28 | |
| Uniform Delay, d1 | 28.3 | | 26.8 | | 33.1 | | 33.0 | 14.6 | 8.7 | 32.8 | 9.8 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.1 | | 0.2 | | 0.1 | | 0.6 | 2.8 | 0.0 | 1.3 | 0.1 | |
| Delay (s) | 30.5 | | 27.0 | | 33.2 | | 33.6 | 17.4 | 8.7 | 34.1 | 9.9 | |
| Level of Service | C | | C | | C | | C | B | A | C | A | |
| Approach Delay (s) | | 28.0 | | | 33.2 | | | 17.9 | | | 11.2 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 18.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.70 | | |
| Actuated Cycle Length (s) | 71.3 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 62.3% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1484 | 20 | 30 | 1037 | 0 | 20 |
| Future Volume (Veh/h) | 1484 | 20 | 30 | 1037 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1562 | 21 | 32 | 1092 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.94 | |
| vC, conflicting volume | | | 1583 | | 1990 | 781 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1583 | | 1823 | 781 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 411 | | 59 | 338 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 781 | 781 | 21 | 32 | 364 | 364 | 364 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 411 | 1700 | 1700 | 1700 | 338 |
| Volume to Capacity | 0.46 | 0.46 | 0.01 | 0.08 | 0.21 | 0.21 | 0.21 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.5 | 0.0 | 0.0 | 0.0 | 16.4 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.4 | | | | 16.4 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 51.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 316 | 723 | 0 | 0 | 442 | 595 | 12 | 0 | 781 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 316 | 723 | 0 | 0 | 442 | 595 | 12 | 0 | 781 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 333 | 761 | 0 | 0 | 465 | 626 | 13 | 0 | 822 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | | | | | | | | | | | | |
| vC, conflicting volume | 465 | | | 761 | | | 1660 | 1892 | 761 | 1892 | 1892 | 232 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 465 | | | 761 | | | 1660 | 1892 | 761 | 1892 | 1892 | 232 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 70 | | | 100 | | | 74 | 100 | 50 | 100 | 100 | 100 |
| cM capacity (veh/h) | 1107 | | | 860 | | | 50 | 49 | 1656 | 17 | 49 | 776 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 333 | 761 | 232 | 232 | 626 | 13 | 822 |
| Volume Left | 333 | 0 | 0 | 0 | 0 | 13 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 626 | 0 | 822 |
| cSH | 1107 | 1700 | 1700 | 1700 | 1700 | 50 | 1656 |
| Volume to Capacity | 0.30 | 0.45 | 0.14 | 0.14 | 0.37 | 0.26 | 0.50 |
| Queue Length 95th (ft) | 32 | 0 | 0 | 0 | 0 | 22 | 72 |
| Control Delay (s) | 9.6 | 0.0 | 0.0 | 0.0 | 0.0 | 100.4 | 9.3 |
| Lane LOS | A | | | | | F | A |
| Approach Delay (s) | 2.9 | | 0.0 | | | 10.7 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.0 | | |
| Intersection Capacity Utilization | 93.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 26 | 767 | 183 | 271 | 272 | 130 |
| Future Volume (Veh/h) | 26 | 767 | 183 | 271 | 272 | 130 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 27 | 807 | 193 | 285 | 286 | 137 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 193 | | | | 1054 | 193 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 193 | | | | 1054 | 193 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 98 | | | | 0 | 84 |
| cM capacity (veh/h) | 1392 | | | | 246 | 854 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 834 | 193 | 285 | 286 | 137 |
| Volume Left | 27 | 0 | 0 | 286 | 0 |
| Volume Right | 0 | 0 | 285 | 0 | 137 |
| cSH | 1392 | 1700 | 1700 | 246 | 854 |
| Volume to Capacity | 0.02 | 0.11 | 0.17 | 1.16 | 0.16 |
| Queue Length 95th (ft) | 1 | 0 | 0 | 328 | 14 |
| Control Delay (s) | 0.5 | 0.0 | 0.0 | 150.2 | 10.0 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.5 | 0.0 | | 104.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 25.8 | | |
| Intersection Capacity Utilization | 76.5% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 194 | 42 | 1 | 152 | 22 | 0 |
| Future Volume (Veh/h) | 194 | 42 | 1 | 152 | 22 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 204 | 44 | 1 | 160 | 23 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 248 | | 388 | 226 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 248 | | 388 | 226 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 96 | 100 |
| cM capacity (veh/h) | | | 1318 | | 615 | 813 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 248 | 161 | 23 |
| Volume Left | 0 | 1 | 23 |
| Volume Right | 44 | 0 | 0 |
| cSH | 1700 | 1318 | 615 |
| Volume to Capacity | 0.15 | 0.00 | 0.04 |
| Queue Length 95th (ft) | 0 | 0 | 3 |
| Control Delay (s) | 0.0 | 0.1 | 11.1 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 11.1 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.6 | | |
| Intersection Capacity Utilization | 22.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 12 | 110 | 5 | 12 | 180 |
| Future Volume (Veh/h) | 10 | 12 | 110 | 5 | 12 | 180 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 13 | 116 | 5 | 13 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 334 | 118 | | | 121 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 334 | 118 | | | 121 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 99 | | | 99 | |
| cM capacity (veh/h) | 656 | 933 | | | 1467 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 24 | 121 | 202 |
| Volume Left | 11 | 0 | 13 |
| Volume Right | 13 | 5 | 0 |
| cSH | 782 | 1700 | 1467 |
| Volume to Capacity | 0.03 | 0.07 | 0.01 |
| Queue Length 95th (ft) | 2 | 0 | 1 |
| Control Delay (s) | 9.8 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.8 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 26.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Future Volume (Veh/h) | 2 | 2 | 10 | 2 | 2 | 10 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 11 | 2 | 2 | 11 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 27 | 12 | | | 13 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 27 | 12 | | | 13 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 987 | 1069 | | | 1606 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 13 | 13 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1026 | 1700 | 1606 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.5 | 0.0 | 1.1 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.5 | 0.0 | 1.1 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.6 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Cumulative No Project AM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 130 | 5 | 140 | 200 | 920 | 50 | 120 | 1490 | 290 |
| Future Volume (vph) | 70 | 0 | 10 | 130 | 5 | 140 | 200 | 920 | 50 | 120 | 1490 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 140 | 5 | 151 | 215 | 989 | 54 | 129 | 1602 | 312 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 131 | 0 | 0 | 0 | 29 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 140 | 25 | 0 | 215 | 989 | 25 | 129 | 1892 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 3.0 | 0.7 | 0.7 | 12.5 | 10.2 | | 8.1 | 36.2 | 36.2 | 9.7 | 37.8 | |
| Effective Green, g (s) | 3.0 | 0.7 | 0.7 | 12.5 | 10.2 | | 8.1 | 36.2 | 36.2 | 9.7 | 37.8 | |
| Actuated g/C Ratio | 0.04 | 0.01 | 0.01 | 0.16 | 0.13 | | 0.11 | 0.47 | 0.47 | 0.13 | 0.49 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 136 | 13 | 13 | 293 | 213 | | 368 | 1680 | 743 | 227 | 2484 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.08 | c0.02 | | 0.06 | 0.28 | | c0.07 | c0.37 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.55 | 0.00 | 0.00 | 0.48 | 0.12 | | 0.58 | 0.59 | 0.03 | 0.57 | 0.76 | |
| Uniform Delay, d1 | 36.3 | 37.8 | 37.8 | 29.3 | 29.4 | | 32.8 | 14.9 | 11.0 | 31.7 | 15.9 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.7 | 0.0 | 0.0 | 0.4 | 0.1 | | 1.5 | 0.5 | 0.0 | 1.9 | 1.4 | |
| Delay (s) | 39.1 | 37.9 | 37.8 | 29.7 | 29.5 | | 34.4 | 15.5 | 11.0 | 33.6 | 17.4 | |
| Level of Service | D | D | D | C | C | | C | B | B | C | B | |
| Approach Delay (s) | | 38.9 | | | 29.6 | | | 18.5 | | | 18.4 | |
| Approach LOS | | D | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.8 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 77.0 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 68.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1110 | 10 | 40 | 1330 | 260 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1110 | 10 | 40 | 1330 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5049 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5049 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 387 | 1194 | 11 | 43 | 1430 | 280 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 387 | 1194 | 7 | 43 | 1691 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 101 | | 91 | | 83 | | 565 | 2157 | 955 | 97 | 2504 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.33 | | 0.02 | c0.33 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.55 | 0.01 | 0.44 | 0.68 | |
| Uniform Delay, d1 | 34.3 | | 34.0 | | 34.6 | | 30.1 | 9.0 | 6.0 | 34.9 | 14.5 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.7 | 0.3 | 0.0 | 1.2 | 0.7 | |
| Delay (s) | 34.7 | | 34.1 | | 34.7 | | 32.9 | 9.3 | 6.0 | 36.1 | 15.3 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.2 | | | 34.7 | | | 15.0 | | | 15.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.60 | | |
| Actuated Cycle Length (s) | 76.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 65.4% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1460 | 10 | 0 | 1460 | 0 | 20 |
| Future Volume (Veh/h) | 1460 | 10 | 0 | 1460 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1570 | 11 | 0 | 1570 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.77 | |
| vC, conflicting volume | | | 1581 | | 2093 | 785 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1581 | | 1356 | 785 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 93 |
| cM capacity (veh/h) | | | 412 | | 107 | 336 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 785 | 785 | 11 | 0 | 523 | 523 | 523 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 336 |
| Volume to Capacity | 0.46 | 0.46 | 0.01 | 0.00 | 0.31 | 0.31 | 0.31 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.5 |
| Lane LOS | | | | | | | | C |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 16.5 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 50.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 180 | 720 | 0 | 0 | 1080 | 380 | 30 | 0 | 750 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 180 | 720 | 0 | 0 | 1080 | 380 | 30 | 0 | 750 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 194 | 774 | 0 | 0 | 1161 | 409 | 32 | 0 | 806 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.76 | | | | | | 0.76 | 0.76 | | 0.76 | 0.76 | 0.76 |
| vC, conflicting volume | 1161 | | | 774 | | | 1742 | 2323 | 774 | 2323 | 2323 | 580 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 589 | | | 774 | | | 1352 | 2113 | 774 | 2113 | 2113 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 74 | | | 100 | | | 45 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 754 | | | 851 | | | 58 | 29 | 1656 | 9 | 29 | 832 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 194 | 774 | 580 | 580 | 409 | 32 | 806 |
| Volume Left | 194 | 0 | 0 | 0 | 0 | 32 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 409 | 0 | 806 |
| cSH | 754 | 1700 | 1700 | 1700 | 1700 | 58 | 1656 |
| Volume to Capacity | 0.26 | 0.46 | 0.34 | 0.34 | 0.24 | 0.55 | 0.49 |
| Queue Length 95th (ft) | 26 | 0 | 0 | 0 | 0 | 55 | 69 |
| Control Delay (s) | 11.4 | 0.0 | 0.0 | 0.0 | 0.0 | 125.4 | 9.2 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 2.3 | | 0.0 | | | 13.7 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.0 | | |
| Intersection Capacity Utilization | 91.0% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 140 | 460 | 450 | 660 | 440 | 150 |
| Future Volume (Veh/h) | 140 | 460 | 450 | 660 | 440 | 150 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 151 | 495 | 484 | 710 | 473 | 161 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 484 | | | | 1281 | 484 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 484 | | | | 1281 | 484 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 86 | | | | 0 | 73 |
| cM capacity (veh/h) | 1089 | | | | 152 | 587 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 646 | 484 | 710 | 473 | 161 |
| Volume Left | 151 | 0 | 0 | 473 | 0 |
| Volume Right | 0 | 0 | 710 | 0 | 161 |
| cSH | 1089 | 1700 | 1700 | 152 | 587 |
| Volume to Capacity | 0.14 | 0.28 | 0.42 | 3.11 | 0.27 |
| Queue Length 95th (ft) | 12 | 0 | 0 | Err | 28 |
| Control Delay (s) | 3.4 | 0.0 | 0.0 | Err | 13.4 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.4 | 0.0 | | 7463.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1913.5 | | |
| Intersection Capacity Utilization | 90.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 80 | 80 | 1 | 160 | 110 | 2 |
| Future Volume (Veh/h) | 80 | 80 | 1 | 160 | 110 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 86 | 86 | 1 | 172 | 118 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 172 | | 304 | 130 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 172 | | 304 | 130 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 83 | 100 |
| cM capacity (veh/h) | | | 1405 | | 687 | 919 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 172 | 173 | 120 |
| Volume Left | 0 | 1 | 118 |
| Volume Right | 86 | 0 | 2 |
| cSH | 1700 | 1405 | 690 |
| Volume to Capacity | 0.10 | 0.00 | 0.17 |
| Queue Length 95th (ft) | 0 | 0 | 16 |
| Control Delay (s) | 0.0 | 0.0 | 11.3 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.3 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.9 | | |
| Intersection Capacity Utilization | 22.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 50 | 160 | 10 | 60 | 400 |
| Future Volume (Veh/h) | 20 | 50 | 160 | 10 | 60 | 400 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 22 | 54 | 172 | 11 | 65 | 430 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 738 | 178 | | | 183 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 738 | 178 | | | 183 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 94 | 94 | | | 95 | |
| cM capacity (veh/h) | 367 | 866 | | | 1392 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 76 | 183 | 495 |
| Volume Left | 22 | 0 | 65 |
| Volume Right | 54 | 11 | 0 |
| cSH | 622 | 1700 | 1392 |
| Volume to Capacity | 0.12 | 0.11 | 0.05 |
| Queue Length 95th (ft) | 10 | 0 | 4 |
| Control Delay (s) | 11.6 | 0.0 | 1.4 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.6 | 0.0 | 1.4 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 47.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 30 | 30 | 20 | 20 | 20 | 20 |
| Future Volume (Veh/h) | 30 | 30 | 20 | 20 | 20 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 32 | 32 | 22 | 22 | 22 | 22 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 100 | 33 | | | 44 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 100 | 33 | | | 44 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 96 | 97 | | | 99 | |
| cM capacity (veh/h) | 885 | 1041 | | | 1564 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 64 | 44 | 44 |
| Volume Left | 32 | 0 | 22 |
| Volume Right | 32 | 22 | 0 |
| cSH | 957 | 1700 | 1564 |
| Volume to Capacity | 0.07 | 0.03 | 0.01 |
| Queue Length 95th (ft) | 5 | 0 | 1 |
| Control Delay (s) | 9.0 | 0.0 | 3.7 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 3.7 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.9 | | |
| Intersection Capacity Utilization | 19.0% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 340 | 5 | 150 | 80 | 0 | 90 | 20 | 1510 | 80 | 120 | 860 | 60 |
| Future Volume (vph) | 340 | 5 | 150 | 80 | 0 | 90 | 20 | 1510 | 80 | 120 | 860 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 358 | 5 | 158 | 84 | 0 | 95 | 21 | 1589 | 84 | 126 | 905 | 63 |
| RTOR Reduction (vph) | 0 | 69 | 69 | 0 | 85 | 0 | 0 | 0 | 39 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 358 | 15 | 10 | 84 | 10 | 0 | 21 | 1589 | 45 | 126 | 963 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 9.2 | 11.4 | 11.4 | 6.8 | 9.0 | | 1.4 | 47.6 | 47.6 | 6.1 | 52.3 | |
| Effective Green, g (s) | 9.2 | 11.4 | 11.4 | 6.8 | 9.0 | | 1.4 | 47.6 | 47.6 | 6.1 | 52.3 | |
| Actuated g/C Ratio | 0.10 | 0.13 | 0.13 | 0.08 | 0.10 | | 0.02 | 0.53 | 0.53 | 0.07 | 0.58 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 358 | 196 | 194 | 136 | 161 | | 54 | 1913 | 835 | 122 | 2960 | |
| v/s Ratio Prot | c0.10 | c0.01 | | 0.05 | 0.01 | | 0.01 | c0.44 | | c0.07 | 0.19 | |
| v/s Ratio Perm | | | 0.01 | | | | | | 0.03 | | | |
| v/c Ratio | 1.00 | 0.08 | 0.05 | 0.62 | 0.06 | | 0.39 | 0.83 | 0.05 | 1.03 | 0.33 | |
| Uniform Delay, d1 | 40.3 | 34.6 | 34.4 | 40.2 | 36.6 | | 43.8 | 17.7 | 10.2 | 41.9 | 9.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 47.6 | 0.1 | 0.0 | 5.8 | 0.1 | | 1.7 | 3.2 | 0.0 | 90.5 | 0.1 | |
| Delay (s) | 87.9 | 34.6 | 34.5 | 46.0 | 36.6 | | 45.5 | 20.9 | 10.2 | 132.4 | 9.7 | |
| Level of Service | F | C | C | D | D | | D | C | B | F | A | |
| Approach Delay (s) | | 71.2 | | | 41.0 | | | 20.7 | | | 23.8 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 30.3 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.76 | | |
| Actuated Cycle Length (s) | 89.8 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 76.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1400 | 30 | 40 | 1030 | 20 |
| Future Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1400 | 30 | 40 | 1030 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 179 | 0 | 379 | 21 | 0 | 42 | 63 | 1474 | 32 | 42 | 1084 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 319 | 0 | 60 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 179 | 0 | 60 | 0 | 3 | 0 | 63 | 1474 | 16 | 42 | 1103 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.6 | | 11.6 | | 3.8 | | 3.4 | 35.8 | 35.8 | 3.9 | 36.3 | |
| Effective Green, g (s) | 11.6 | | 11.6 | | 3.8 | | 3.4 | 35.8 | 35.8 | 3.9 | 36.3 | |
| Actuated g/C Ratio | 0.16 | | 0.16 | | 0.05 | | 0.05 | 0.49 | 0.49 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | | 255 | | 88 | | 162 | 1765 | 771 | 96 | 2539 | |
| v/s Ratio Prot | c0.10 | | | | c0.00 | | 0.02 | c0.41 | | c0.02 | 0.22 | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.01 | | | |
| v/c Ratio | 0.63 | | 0.24 | | 0.04 | | 0.39 | 0.84 | 0.02 | 0.44 | 0.43 | |
| Uniform Delay, d1 | 28.8 | | 26.9 | | 33.0 | | 33.9 | 16.2 | 9.7 | 33.6 | 11.9 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | | 0.2 | | 0.1 | | 0.6 | 3.6 | 0.0 | 1.2 | 0.1 | |
| Delay (s) | 31.8 | | 27.1 | | 33.0 | | 34.5 | 19.7 | 9.7 | 34.7 | 12.0 | |
| Level of Service | C | | C | | C | | C | B | A | C | B | |
| Approach Delay (s) | | 28.6 | | | 33.0 | | | 20.1 | | | 12.8 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.3 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 73.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 63.0% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1470 | 20 | 30 | 1380 | 0 | 20 |
| Future Volume (Veh/h) | 1470 | 20 | 30 | 1380 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1547 | 21 | 32 | 1453 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.87 | |
| vC, conflicting volume | | | 1568 | | 2095 | 774 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1568 | | 1744 | 774 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 417 | | 62 | 341 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 774 | 774 | 21 | 32 | 484 | 484 | 484 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 417 | 1700 | 1700 | 1700 | 341 |
| Volume to Capacity | 0.46 | 0.46 | 0.01 | 0.08 | 0.28 | 0.28 | 0.28 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.4 | 0.0 | 0.0 | 0.0 | 16.2 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.3 | | | | 16.2 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 50.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 410 | 740 | 0 | 0 | 780 | 600 | 20 | 0 | 750 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 410 | 740 | 0 | 0 | 780 | 600 | 20 | 0 | 750 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 432 | 779 | 0 | 0 | 821 | 632 | 21 | 0 | 789 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | 0.94 | | | | | | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 |
| vC, conflicting volume | 821 | | | 779 | | | 2054 | 2464 | 779 | 2464 | 2464 | 410 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 691 | | | 779 | | | 1997 | 2432 | 779 | 2432 | 2432 | 256 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 50 | | | 100 | | | 0 | 100 | 52 | 100 | 100 | 100 |
| cM capacity (veh/h) | 862 | | | 847 | | | 21 | 15 | 1656 | 5 | 15 | 707 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 432 | 779 | 410 | 410 | 632 | 21 | 789 |
| Volume Left | 432 | 0 | 0 | 0 | 0 | 21 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 632 | 0 | 789 |
| cSH | 862 | 1700 | 1700 | 1700 | 1700 | 21 | 1656 |
| Volume to Capacity | 0.50 | 0.46 | 0.24 | 0.24 | 0.37 | 1.01 | 0.48 |
| Queue Length 95th (ft) | 72 | 0 | 0 | 0 | 0 | 71 | 67 |
| Control Delay (s) | 13.3 | 0.0 | 0.0 | 0.0 | 0.0 | 461.4 | 9.1 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 4.7 | | 0.0 | | | 20.9 | |
| Approach LOS | | | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.5 | | |
| Intersection Capacity Utilization | 92.1% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 40 | 890 | 270 | 530 | 260 | 210 |
| Future Volume (Veh/h) | 40 | 890 | 270 | 530 | 260 | 210 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 42 | 937 | 284 | 558 | 274 | 221 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 284 | | | | 1305 | 284 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 284 | | | | 1305 | 284 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 0 | 71 |
| cM capacity (veh/h) | 1290 | | | | 172 | 760 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 979 | 284 | 558 | 274 | 221 |
| Volume Left | 42 | 0 | 0 | 274 | 0 |
| Volume Right | 0 | 0 | 558 | 0 | 221 |
| cSH | 1290 | 1700 | 1700 | 172 | 760 |
| Volume to Capacity | 0.03 | 0.17 | 0.33 | 1.60 | 0.29 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 459 | 30 |
| Control Delay (s) | 0.9 | 0.0 | 0.0 | 341.5 | 11.7 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.9 | 0.0 | | 194.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 41.9 | | |
| Intersection Capacity Utilization | 88.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 100 | 100 | 1 | 80 | 80 | 0 |
| Future Volume (Veh/h) | 100 | 100 | 1 | 80 | 80 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 105 | 105 | 1 | 84 | 84 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 210 | | 244 | 158 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 210 | | 244 | 158 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 89 | 100 |
| cM capacity (veh/h) | | | 1361 | | 744 | 888 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 210 | 85 | 84 |
| Volume Left | 0 | 1 | 84 |
| Volume Right | 105 | 0 | 0 |
| cSH | 1700 | 1361 | 744 |
| Volume to Capacity | 0.12 | 0.00 | 0.11 |
| Queue Length 95th (ft) | 0 | 0 | 9 |
| Control Delay (s) | 0.0 | 0.1 | 10.5 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.5 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 22.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 50 | 190 | 10 | 60 | 250 |
| Future Volume (Veh/h) | 10 | 50 | 190 | 10 | 60 | 250 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 53 | 200 | 11 | 63 | 263 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 594 | 206 | | | 211 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 594 | 206 | | | 211 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 94 | | | 95 | |
| cM capacity (veh/h) | 446 | 835 | | | 1360 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 64 | 211 | 326 |
| Volume Left | 11 | 0 | 63 |
| Volume Right | 53 | 11 | 0 |
| cSH | 726 | 1700 | 1360 |
| Volume to Capacity | 0.09 | 0.12 | 0.05 |
| Queue Length 95th (ft) | 7 | 0 | 4 |
| Control Delay (s) | 10.4 | 0.0 | 1.8 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.4 | 0.0 | 1.8 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 40.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 40 | 20 | 40 | 30 | 20 |
| Future Volume (Veh/h) | 20 | 40 | 20 | 40 | 30 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 21 | 42 | 21 | 42 | 32 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 127 | 42 | | | 63 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 127 | 42 | | | 63 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 98 | |
| cM capacity (veh/h) | 850 | 1029 | | | 1540 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 63 | 63 | 53 |
| Volume Left | 21 | 0 | 32 |
| Volume Right | 42 | 42 | 0 |
| cSH | 961 | 1700 | 1540 |
| Volume to Capacity | 0.07 | 0.04 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 2 |
| Control Delay (s) | 9.0 | 0.0 | 4.5 |
| Lane LOS | A | | A |
| Approach Delay (s) | 9.0 | 0.0 | 4.5 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.5 | | |
| Intersection Capacity Utilization | 19.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 137 | 5 | 150 | 200 | 921 | 51 | 123 | 1490 | 290 |
| Future Volume (vph) | 70 | 0 | 10 | 137 | 5 | 150 | 200 | 921 | 51 | 123 | 1490 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1608 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1608 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 147 | 5 | 161 | 215 | 990 | 55 | 132 | 1602 | 312 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 140 | 0 | 0 | 0 | 29 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 147 | 26 | 0 | 215 | 990 | 26 | 132 | 1892 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 3.0 | 0.7 | 0.7 | 12.6 | 10.3 | | 8.1 | 36.1 | 36.1 | 9.9 | 37.9 | |
| Effective Green, g (s) | 3.0 | 0.7 | 0.7 | 12.6 | 10.3 | | 8.1 | 36.1 | 36.1 | 9.9 | 37.9 | |
| Actuated g/C Ratio | 0.04 | 0.01 | 0.01 | 0.16 | 0.13 | | 0.10 | 0.47 | 0.47 | 0.13 | 0.49 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 136 | 13 | 13 | 294 | 214 | | 367 | 1671 | 739 | 231 | 2484 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.08 | c0.02 | | 0.06 | 0.28 | | c0.07 | c0.37 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.55 | 0.00 | 0.00 | 0.50 | 0.12 | | 0.59 | 0.59 | 0.03 | 0.57 | 0.76 | |
| Uniform Delay, d1 | 36.4 | 37.9 | 37.9 | 29.4 | 29.5 | | 33.0 | 15.1 | 11.1 | 31.7 | 16.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.7 | 0.0 | 0.0 | 0.5 | 0.1 | | 1.5 | 0.6 | 0.0 | 2.1 | 1.4 | |
| Delay (s) | 39.2 | 38.0 | 37.9 | 29.9 | 29.6 | | 34.5 | 15.7 | 11.1 | 33.8 | 17.4 | |
| Level of Service | D | D | D | C | C | | C | B | B | C | B | |
| Approach Delay (s) | | 39.0 | | | 29.7 | | | 18.7 | | | 18.5 | |
| Approach LOS | | D | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.69 | | |
| Actuated Cycle Length (s) | 77.2 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 68.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 41 | 360 | 1111 | 10 | 40 | 1337 | 260 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 41 | 360 | 1111 | 10 | 40 | 1337 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1713 | | 3502 | 3574 | 1582 | 1805 | 5050 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1713 | | 3502 | 3574 | 1582 | 1805 | 5050 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 44 | 387 | 1195 | 11 | 43 | 1438 | 280 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 83 | 0 | 0 | 0 | 4 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 387 | 1195 | 7 | 43 | 1699 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 101 | | 91 | | 83 | | 565 | 2157 | 955 | 97 | 2505 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.33 | | 0.02 | c0.34 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.55 | 0.01 | 0.44 | 0.68 | |
| Uniform Delay, d1 | 34.3 | | 34.0 | | 34.6 | | 30.1 | 9.0 | 6.0 | 34.9 | 14.6 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.7 | 0.3 | 0.0 | 1.2 | 0.7 | |
| Delay (s) | 34.7 | | 34.1 | | 34.7 | | 32.9 | 9.3 | 6.0 | 36.1 | 15.3 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.2 | | | 34.7 | | | 15.0 | | | 15.8 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 76.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 65.6% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1461 | 11 | 0 | 1467 | 0 | 20 |
| Future Volume (Veh/h) | 1461 | 11 | 0 | 1467 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1571 | 12 | 0 | 1577 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.76 | |
| vC, conflicting volume | | | 1583 | | 2097 | 786 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1583 | | 1354 | 786 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 93 |
| cM capacity (veh/h) | | | 411 | | 108 | 335 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 786 | 786 | 12 | 0 | 526 | 526 | 526 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 335 |
| Volume to Capacity | 0.46 | 0.46 | 0.01 | 0.00 | 0.31 | 0.31 | 0.31 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.5 |
| Lane LOS | | | | | | | | C |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 16.5 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 50.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 185 | 721 | 0 | 0 | 1083 | 385 | 30 | 0 | 752 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 185 | 721 | 0 | 0 | 1083 | 385 | 30 | 0 | 752 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 199 | 775 | 0 | 0 | 1165 | 414 | 32 | 0 | 809 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.76 | | | | | | 0.76 | 0.76 | | 0.76 | 0.76 | 0.76 |
| vC, conflicting volume | 1165 | | | 775 | | | 1756 | 2338 | 775 | 2338 | 2338 | 582 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 590 | | | 775 | | | 1366 | 2131 | 775 | 2131 | 2131 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 74 | | | 100 | | | 43 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 752 | | | 850 | | | 56 | 28 | 1656 | 9 | 28 | 831 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 199 | 775 | 582 | 582 | 414 | 32 | 809 |
| Volume Left | 199 | 0 | 0 | 0 | 0 | 32 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 414 | 0 | 809 |
| cSH | 752 | 1700 | 1700 | 1700 | 1700 | 56 | 1656 |
| Volume to Capacity | 0.26 | 0.46 | 0.34 | 0.34 | 0.24 | 0.57 | 0.49 |
| Queue Length 95th (ft) | 27 | 0 | 0 | 0 | 0 | 57 | 70 |
| Control Delay (s) | 11.5 | 0.0 | 0.0 | 0.0 | 0.0 | 132.6 | 9.2 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 2.3 | | 0.0 | | | 13.9 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.1 | | |
| Intersection Capacity Utilization | 91.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 143 | 465 | 450 | 663 | 441 | 151 |
| Future Volume (Veh/h) | 143 | 465 | 450 | 663 | 441 | 151 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 154 | 500 | 484 | 713 | 474 | 162 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 484 | | | | 1292 | 484 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 484 | | | | 1292 | 484 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 86 | | | | 0 | 72 |
| cM capacity (veh/h) | 1089 | | | | 149 | 587 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 654 | 484 | 713 | 474 | 162 |
| Volume Left | 154 | 0 | 0 | 474 | 0 |
| Volume Right | 0 | 0 | 713 | 0 | 162 |
| cSH | 1089 | 1700 | 1700 | 149 | 587 |
| Volume to Capacity | 0.14 | 0.28 | 0.42 | 3.17 | 0.28 |
| Queue Length 95th (ft) | 12 | 0 | 0 | Err | 28 |
| Control Delay (s) | 3.4 | 0.0 | 0.0 | Err | 13.5 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.4 | 0.0 | | 7455.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1907.5 | | |
| Intersection Capacity Utilization | 90.5% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 80 | 84 | 1 | 160 | 127 | 2 |
| Future Volume (Veh/h) | 80 | 84 | 1 | 160 | 127 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 86 | 90 | 1 | 172 | 137 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 176 | | 306 | 132 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 176 | | 306 | 132 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 80 | 100 |
| cM capacity (veh/h) | | | 1400 | | 685 | 917 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 176 | 173 | 139 |
| Volume Left | 0 | 1 | 137 |
| Volume Right | 90 | 0 | 2 |
| cSH | 1700 | 1400 | 687 |
| Volume to Capacity | 0.10 | 0.00 | 0.20 |
| Queue Length 95th (ft) | 0 | 0 | 19 |
| Control Delay (s) | 0.0 | 0.0 | 11.6 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.6 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.3 | | |
| Intersection Capacity Utilization | 23.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 58 | 160 | 10 | 62 | 400 |
| Future Volume (Veh/h) | 20 | 58 | 160 | 10 | 62 | 400 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 22 | 62 | 172 | 11 | 67 | 430 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 742 | 178 | | | 183 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 742 | 178 | | | 183 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 94 | 93 | | | 95 | |
| cM capacity (veh/h) | 365 | 866 | | | 1392 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 84 | 183 | 497 |
| Volume Left | 22 | 0 | 67 |
| Volume Right | 62 | 11 | 0 |
| cSH | 637 | 1700 | 1392 |
| Volume to Capacity | 0.13 | 0.11 | 0.05 |
| Queue Length 95th (ft) | 11 | 0 | 4 |
| Control Delay (s) | 11.5 | 0.0 | 1.5 |
| Lane LOS | B | | A |
| Approach Delay (s) | 11.5 | 0.0 | 1.5 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.2 | | |
| Intersection Capacity Utilization | 48.2% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 40 | 2 | 2 | 57 |
| Future Volume (Veh/h) | 2 | 2 | 40 | 2 | 2 | 57 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 43 | 2 | 2 | 61 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 110 | 44 | | | 45 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 110 | 44 | | | 45 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 885 | 1026 | | | 1563 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 45 | 63 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 950 | 1700 | 1563 |
| Volume to Capacity | 0.00 | 0.03 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.8 | 0.0 | 0.2 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.8 | 0.0 | 0.2 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 14.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Cumulative Plus Project PM

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 340 | 5 | 150 | 84 | 0 | 97 | 20 | 1511 | 85 | 132 | 860 | 60 |
| Future Volume (vph) | 340 | 5 | 150 | 84 | 0 | 97 | 20 | 1511 | 85 | 132 | 860 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 358 | 5 | 158 | 88 | 0 | 102 | 21 | 1591 | 89 | 139 | 905 | 63 |
| RTOR Reduction (vph) | 0 | 69 | 69 | 0 | 92 | 0 | 0 | 0 | 42 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 358 | 15 | 10 | 88 | 10 | 0 | 21 | 1591 | 47 | 139 | 963 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 9.2 | 11.3 | 11.3 | 7.0 | 9.1 | | 1.4 | 47.6 | 47.6 | 6.1 | 52.3 | |
| Effective Green, g (s) | 9.2 | 11.3 | 11.3 | 7.0 | 9.1 | | 1.4 | 47.6 | 47.6 | 6.1 | 52.3 | |
| Actuated g/C Ratio | 0.10 | 0.13 | 0.13 | 0.08 | 0.10 | | 0.02 | 0.53 | 0.53 | 0.07 | 0.58 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 358 | 194 | 192 | 140 | 163 | | 54 | 1911 | 834 | 122 | 2957 | |
| v/s Ratio Prot | c0.10 | c0.01 | | 0.05 | 0.01 | | 0.01 | c0.44 | | c0.08 | 0.19 | |
| v/s Ratio Perm | | | 0.01 | | | | | | 0.03 | | | |
| v/c Ratio | 1.00 | 0.08 | 0.05 | 0.63 | 0.06 | | 0.39 | 0.83 | 0.06 | 1.14 | 0.33 | |
| Uniform Delay, d1 | 40.4 | 34.7 | 34.6 | 40.2 | 36.5 | | 43.8 | 17.8 | 10.3 | 41.9 | 9.7 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 47.6 | 0.1 | 0.0 | 6.2 | 0.1 | | 1.7 | 3.3 | 0.0 | 123.8 | 0.1 | |
| Delay (s) | 87.9 | 34.8 | 34.6 | 46.4 | 36.6 | | 45.5 | 21.1 | 10.3 | 165.7 | 9.8 | |
| Level of Service | F | C | C | D | D | | D | C | B | F | A | |
| Approach Delay (s) | | 71.3 | | | 41.1 | | | 20.8 | | | 29.3 | |
| Approach LOS | | E | | | D | | | C | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 32.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 89.9 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 77.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 170 | 0 | 360 | 20 | 0 | 41 | 60 | 1405 | 30 | 40 | 1034 | 20 |
| Future Volume (vph) | 170 | 0 | 360 | 20 | 0 | 41 | 60 | 1405 | 30 | 40 | 1034 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1700 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1700 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 179 | 0 | 379 | 21 | 0 | 43 | 63 | 1479 | 32 | 42 | 1088 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 319 | 0 | 61 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 179 | 0 | 60 | 0 | 3 | 0 | 63 | 1479 | 16 | 42 | 1107 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Effective Green, g (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Actuated g/C Ratio | 0.16 | | 0.16 | | 0.05 | | 0.06 | 0.49 | 0.49 | 0.05 | 0.48 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | | 255 | | 88 | | 215 | 1765 | 771 | 96 | 2462 | |
| v/s Ratio Prot | c0.10 | | | | c0.00 | | 0.02 | c0.41 | | c0.02 | 0.22 | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.01 | | | |
| v/c Ratio | 0.63 | | 0.24 | | 0.04 | | 0.29 | 0.84 | 0.02 | 0.44 | 0.45 | |
| Uniform Delay, d1 | 28.8 | | 26.9 | | 33.0 | | 32.8 | 16.2 | 9.7 | 33.6 | 12.6 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | | 0.2 | | 0.1 | | 0.3 | 3.7 | 0.0 | 1.2 | 0.1 | |
| Delay (s) | 31.8 | | 27.1 | | 33.0 | | 33.1 | 19.8 | 9.7 | 34.7 | 12.7 | |
| Level of Service | C | | C | | C | | C | B | A | C | B | |
| Approach Delay (s) | | 28.6 | | | 33.0 | | | 20.2 | | | 13.5 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 19.5 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 73.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 63.2% | ICU Level of Service | B |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1475 | 23 | 30 | 1384 | 0 | 20 |
| Future Volume (Veh/h) | 1475 | 23 | 30 | 1384 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1553 | 24 | 32 | 1457 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 526 | | |
| pX, platoon unblocked | | | | | 0.87 | |
| vC, conflicting volume | | | 1577 | | 2103 | 776 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1577 | | 1736 | 776 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 414 | | 63 | 340 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 776 | 776 | 24 | 32 | 486 | 486 | 486 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 414 | 1700 | 1700 | 1700 | 340 |
| Volume to Capacity | 0.46 | 0.46 | 0.01 | 0.08 | 0.29 | 0.29 | 0.29 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.4 | 0.0 | 0.0 | 0.0 | 16.3 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.3 | | | | 16.3 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 50.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 413 | 744 | 0 | 0 | 782 | 603 | 21 | 0 | 755 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 413 | 744 | 0 | 0 | 782 | 603 | 21 | 0 | 755 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 435 | 783 | 0 | 0 | 823 | 635 | 22 | 0 | 795 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1166 | | | | | | | |
| pX, platoon unblocked | 0.94 | | | | | | 0.94 | 0.94 | | 0.94 | 0.94 | 0.94 |
| vC, conflicting volume | 823 | | | 783 | | | 2064 | 2476 | 783 | 2476 | 2476 | 412 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 679 | | | 783 | | | 2003 | 2441 | 783 | 2441 | 2441 | 240 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 50 | | | 100 | | | 0 | 100 | 52 | 100 | 100 | 100 |
| cM capacity (veh/h) | 865 | | | 844 | | | 20 | 15 | 1656 | 5 | 15 | 719 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 435 | 783 | 412 | 412 | 635 | 22 | 795 |
| Volume Left | 435 | 0 | 0 | 0 | 0 | 22 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 635 | 0 | 795 |
| cSH | 865 | 1700 | 1700 | 1700 | 1700 | 20 | 1656 |
| Volume to Capacity | 0.50 | 0.46 | 0.24 | 0.24 | 0.37 | 1.08 | 0.48 |
| Queue Length 95th (ft) | 72 | 0 | 0 | 0 | 0 | 74 | 68 |
| Control Delay (s) | 13.3 | 0.0 | 0.0 | 0.0 | 0.0 | 491.8 | 9.2 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 4.7 | | 0.0 | | | 22.2 | |
| Approach LOS | | | | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 6.8 | | |
| Intersection Capacity Utilization | 92.6% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 42 | 893 | 271 | 532 | 264 | 215 |
| Future Volume (Veh/h) | 42 | 893 | 271 | 532 | 264 | 215 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 44 | 940 | 285 | 560 | 278 | 226 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 285 | | | | 1313 | 285 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 285 | | | | 1313 | 285 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 0 | 70 |
| cM capacity (veh/h) | 1289 | | | | 170 | 759 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 984 | 285 | 560 | 278 | 226 |
| Volume Left | 44 | 0 | 0 | 278 | 0 |
| Volume Right | 0 | 0 | 560 | 0 | 226 |
| cSH | 1289 | 1700 | 1700 | 170 | 759 |
| Volume to Capacity | 0.03 | 0.17 | 0.33 | 1.64 | 0.30 |
| Queue Length 95th (ft) | 3 | 0 | 0 | 476 | 31 |
| Control Delay (s) | 0.9 | 0.0 | 0.0 | 360.8 | 11.7 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.9 | 0.0 | | 204.3 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 44.5 | | |
| Intersection Capacity Utilization | 88.9% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 100 | 117 | 1 | 80 | 91 | 0 |
| Future Volume (Veh/h) | 100 | 117 | 1 | 80 | 91 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 105 | 123 | 1 | 84 | 96 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 228 | | 252 | 166 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 228 | | 252 | 166 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 87 | 100 |
| cM capacity (veh/h) | | | 1340 | | 736 | 878 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 228 | 85 | 96 |
| Volume Left | 0 | 1 | 96 |
| Volume Right | 123 | 0 | 0 |
| cSH | 1700 | 1340 | 736 |
| Volume to Capacity | 0.13 | 0.00 | 0.13 |
| Queue Length 95th (ft) | 0 | 0 | 11 |
| Control Delay (s) | 0.0 | 0.1 | 10.6 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 10.6 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.5 | | |
| Intersection Capacity Utilization | 24.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 55 | 190 | 10 | 68 | 250 |
| Future Volume (Veh/h) | 10 | 55 | 190 | 10 | 68 | 250 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 58 | 200 | 11 | 72 | 263 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 612 | 206 | | | 211 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 612 | 206 | | | 211 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 97 | 93 | | | 95 | |
| cM capacity (veh/h) | 432 | 835 | | | 1360 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 69 | 211 | 335 |
| Volume Left | 11 | 0 | 72 |
| Volume Right | 58 | 11 | 0 |
| cSH | 727 | 1700 | 1360 |
| Volume to Capacity | 0.09 | 0.12 | 0.05 |
| Queue Length 95th (ft) | 8 | 0 | 4 |
| Control Delay (s) | 10.5 | 0.0 | 2.1 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.5 | 0.0 | 2.1 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.3 | | |
| Intersection Capacity Utilization | 41.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 69 | 2 | 2 | 44 |
| Future Volume (Veh/h) | 2 | 2 | 69 | 2 | 2 | 44 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 73 | 2 | 2 | 46 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 124 | 74 | | | 75 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 124 | 74 | | | 75 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 870 | 988 | | | 1524 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 75 | 48 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 925 | 1700 | 1524 |
| Volume to Capacity | 0.00 | 0.04 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.9 | 0.0 | 0.3 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.9 | 0.0 | 0.3 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 13.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 158 | 5 | 140 | 200 | 920 | 68 | 120 | 1490 | 290 |
| Future Volume (vph) | 70 | 0 | 10 | 158 | 5 | 140 | 200 | 920 | 68 | 120 | 1490 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1609 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 170 | 5 | 151 | 215 | 989 | 73 | 129 | 1602 | 312 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 131 | 0 | 0 | 0 | 39 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 170 | 25 | 0 | 215 | 989 | 34 | 129 | 1892 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 3.0 | 0.7 | 0.7 | 12.8 | 10.5 | | 8.1 | 36.5 | 36.5 | 9.8 | 38.2 | |
| Effective Green, g (s) | 3.0 | 0.7 | 0.7 | 12.8 | 10.5 | | 8.1 | 36.5 | 36.5 | 9.8 | 38.2 | |
| Actuated g/C Ratio | 0.04 | 0.01 | 0.01 | 0.16 | 0.14 | | 0.10 | 0.47 | 0.47 | 0.13 | 0.49 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 135 | 13 | 13 | 297 | 217 | | 365 | 1678 | 742 | 227 | 2487 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.09 | c0.02 | | 0.06 | 0.28 | | c0.07 | c0.37 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.56 | 0.00 | 0.00 | 0.57 | 0.12 | | 0.59 | 0.59 | 0.05 | 0.57 | 0.76 | |
| Uniform Delay, d1 | 36.7 | 38.2 | 38.2 | 29.9 | 29.5 | | 33.2 | 15.1 | 11.2 | 32.0 | 16.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.8 | 0.0 | 0.0 | 1.7 | 0.1 | | 1.6 | 0.5 | 0.0 | 1.9 | 1.4 | |
| Delay (s) | 39.5 | 38.2 | 38.2 | 31.6 | 29.6 | | 34.8 | 15.6 | 11.2 | 33.9 | 17.5 | |
| Level of Service | D | D | D | C | C | | C | B | B | C | B | |
| Approach Delay (s) | | 39.3 | | | 30.6 | | | 18.6 | | | 18.5 | |
| Approach LOS | | D | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.1 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.71 | | |
| Actuated Cycle Length (s) | 77.7 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 68.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1128 | 10 | 40 | 1358 | 260 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1128 | 10 | 40 | 1358 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5051 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5051 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 387 | 1213 | 11 | 43 | 1460 | 280 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 19 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 387 | 1213 | 7 | 43 | 1721 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 101 | | 91 | | 83 | | 565 | 2157 | 955 | 97 | 2505 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.34 | | 0.02 | c0.34 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.56 | 0.01 | 0.44 | 0.69 | |
| Uniform Delay, d1 | 34.3 | | 34.0 | | 34.6 | | 30.1 | 9.1 | 6.0 | 34.9 | 14.7 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.7 | 0.3 | 0.0 | 1.2 | 0.8 | |
| Delay (s) | 34.7 | | 34.1 | | 34.7 | | 32.9 | 9.4 | 6.0 | 36.1 | 15.5 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.2 | | | 34.7 | | | 15.0 | | | 16.0 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.61 | | |
| Actuated Cycle Length (s) | 76.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 66.0% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1478 | 10 | 0 | 1488 | 0 | 20 |
| Future Volume (Veh/h) | 1478 | 10 | 0 | 1488 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1589 | 11 | 0 | 1600 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.76 | |
| vC, conflicting volume | | | 1600 | | 2122 | 794 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1600 | | 1364 | 794 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 93 |
| cM capacity (veh/h) | | | 405 | | 105 | 331 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 794 | 794 | 11 | 0 | 533 | 533 | 533 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 331 |
| Volume to Capacity | 0.47 | 0.47 | 0.01 | 0.00 | 0.31 | 0.31 | 0.31 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.7 |
| Lane LOS | | | | | | | | C |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 16.7 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 50.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 729 | 0 | 0 | 1094 | 394 | 26 | 0 | 759 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 166 | 729 | 0 | 0 | 1094 | 394 | 26 | 0 | 759 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 178 | 784 | 0 | 0 | 1176 | 424 | 28 | 0 | 816 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.76 | | | | | | 0.76 | 0.76 | | 0.76 | 0.76 | 0.76 |
| vC, conflicting volume | 1176 | | | 784 | | | 1728 | 2316 | 784 | 2316 | 2316 | 588 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 587 | | | 784 | | | 1317 | 2095 | 784 | 2095 | 2095 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 76 | | | 100 | | | 55 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 749 | | | 843 | | | 62 | 30 | 1657 | 10 | 30 | 825 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 178 | 784 | 588 | 588 | 424 | 28 | 816 |
| Volume Left | 178 | 0 | 0 | 0 | 0 | 28 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 424 | 0 | 816 |
| cSH | 749 | 1700 | 1700 | 1700 | 1700 | 62 | 1657 |
| Volume to Capacity | 0.24 | 0.46 | 0.35 | 0.35 | 0.25 | 0.45 | 0.49 |
| Queue Length 95th (ft) | 23 | 0 | 0 | 0 | 0 | 43 | 71 |
| Control Delay (s) | 11.3 | 0.0 | 0.0 | 0.0 | 0.0 | 102.8 | 9.3 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 2.1 | | 0.0 | | | 12.4 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.7 | | |
| Intersection Capacity Utilization | 92.0% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 126 | 446 | 446 | 674 | 449 | 136 |
| Future Volume (Veh/h) | 126 | 446 | 446 | 674 | 449 | 136 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 135 | 480 | 480 | 725 | 483 | 146 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 480 | | | | 1230 | 480 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 480 | | | | 1230 | 480 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 0 | 75 |
| cM capacity (veh/h) | 1093 | | | | 166 | 590 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 615 | 480 | 725 | 483 | 146 |
| Volume Left | 135 | 0 | 0 | 483 | 0 |
| Volume Right | 0 | 0 | 725 | 0 | 146 |
| cSH | 1093 | 1700 | 1700 | 166 | 590 |
| Volume to Capacity | 0.12 | 0.28 | 0.43 | 2.90 | 0.25 |
| Queue Length 95th (ft) | 11 | 0 | 0 | 1093 | 24 |
| Control Delay (s) | 3.1 | 0.0 | 0.0 | 915.3 | 13.1 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.1 | 0.0 | | 705.9 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 182.1 | | |
| Intersection Capacity Utilization | 88.8% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 116 | 62 | 1 | 216 | 82 | 2 |
| Future Volume (Veh/h) | 116 | 62 | 1 | 216 | 82 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 125 | 67 | 1 | 232 | 88 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 192 | | 394 | 160 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 192 | | 394 | 160 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 86 | 100 |
| cM capacity (veh/h) | | | 1381 | | 610 | 885 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 192 | 233 | 90 |
| Volume Left | 0 | 1 | 88 |
| Volume Right | 67 | 0 | 2 |
| cSH | 1700 | 1381 | 614 |
| Volume to Capacity | 0.11 | 0.00 | 0.15 |
| Queue Length 95th (ft) | 0 | 0 | 13 |
| Control Delay (s) | 0.0 | 0.0 | 11.9 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 11.9 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.1 | | |
| Intersection Capacity Utilization | 23.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 22 | 160 | 10 | 42 | 400 |
| Future Volume (Veh/h) | 20 | 22 | 160 | 10 | 42 | 400 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 22 | 24 | 172 | 11 | 45 | 430 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 698 | 178 | | | 183 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 698 | 178 | | | 183 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 94 | 97 | | | 97 | |
| cM capacity (veh/h) | 394 | 866 | | | 1392 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 46 | 183 | 475 |
| Volume Left | 22 | 0 | 45 |
| Volume Right | 24 | 11 | 0 |
| cSH | 550 | 1700 | 1392 |
| Volume to Capacity | 0.08 | 0.11 | 0.03 |
| Queue Length 95th (ft) | 7 | 0 | 3 |
| Control Delay (s) | 12.1 | 0.0 | 1.0 |
| Lane LOS | B | | A |
| Approach Delay (s) | 12.1 | 0.0 | 1.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 45.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Future Volume (Veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 22 | 2 | 2 | 22 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 50 | 23 | | | 24 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 50 | 23 | | | 24 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 957 | 1054 | | | 1591 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 24 | 24 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1003 | 1700 | 1591 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Cumulative PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 340 | 5 | 150 | 98 | 0 | 90 | 20 | 1510 | 118 | 120 | 860 | 60 |
| Future Volume (vph) | 340 | 5 | 150 | 98 | 0 | 90 | 20 | 1510 | 118 | 120 | 860 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1576 | 1805 | 5084 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 358 | 5 | 158 | 103 | 0 | 95 | 21 | 1589 | 124 | 126 | 905 | 63 |
| RTOR Reduction (vph) | 0 | 72 | 72 | 0 | 89 | 0 | 0 | 0 | 44 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 358 | 12 | 7 | 103 | 6 | 0 | 21 | 1589 | 80 | 126 | 963 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 9.0 | 7.1 | 7.1 | 7.4 | 5.5 | | 1.5 | 46.7 | 46.7 | 6.0 | 51.2 | |
| Effective Green, g (s) | 9.0 | 7.1 | 7.1 | 7.4 | 5.5 | | 1.5 | 46.7 | 46.7 | 6.0 | 51.2 | |
| Actuated g/C Ratio | 0.11 | 0.08 | 0.08 | 0.09 | 0.06 | | 0.02 | 0.55 | 0.55 | 0.07 | 0.60 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 370 | 129 | 127 | 156 | 104 | | 61 | 1981 | 864 | 127 | 3058 | |
| v/s Ratio Prot | c0.10 | c0.01 | | 0.06 | 0.00 | | 0.01 | c0.44 | | c0.07 | 0.19 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.05 | | | |
| v/c Ratio | 0.97 | 0.09 | 0.05 | 0.66 | 0.06 | | 0.34 | 0.80 | 0.09 | 0.99 | 0.31 | |
| Uniform Delay, d1 | 37.9 | 36.0 | 35.9 | 37.6 | 37.4 | | 41.3 | 15.5 | 9.1 | 39.5 | 8.3 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 37.6 | 0.1 | 0.1 | 7.8 | 0.1 | | 1.2 | 2.4 | 0.0 | 77.1 | 0.1 | |
| Delay (s) | 75.5 | 36.1 | 36.0 | 45.5 | 37.5 | | 42.5 | 17.9 | 9.2 | 116.6 | 8.4 | |
| Level of Service | E | D | D | D | D | | D | B | A | F | A | |
| Approach Delay (s) | | 63.2 | | | 41.6 | | | 17.6 | | | 20.9 | |
| Approach LOS | | E | | | D | | | B | | | C | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 26.6 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.78 | | |
| Actuated Cycle Length (s) | 85.1 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 76.3% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1438 | 30 | 40 | 1048 | 20 |
| Future Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1438 | 30 | 40 | 1048 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 179 | 0 | 379 | 21 | 0 | 42 | 63 | 1514 | 32 | 42 | 1103 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 319 | 0 | 60 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 179 | 0 | 60 | 0 | 3 | 0 | 63 | 1514 | 16 | 42 | 1122 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Effective Green, g (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Actuated g/C Ratio | 0.16 | | 0.16 | | 0.05 | | 0.06 | 0.49 | 0.49 | 0.05 | 0.48 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | | 255 | | 88 | | 215 | 1765 | 771 | 96 | 2462 | |
| v/s Ratio Prot | c0.10 | | | | c0.00 | | 0.02 | c0.42 | | c0.02 | 0.22 | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.01 | | | |
| v/c Ratio | 0.63 | | 0.24 | | 0.04 | | 0.29 | 0.86 | 0.02 | 0.44 | 0.46 | |
| Uniform Delay, d1 | 28.8 | | 26.9 | | 33.0 | | 32.8 | 16.5 | 9.7 | 33.6 | 12.6 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | | 0.2 | | 0.1 | | 0.3 | 4.4 | 0.0 | 1.2 | 0.1 | |
| Delay (s) | 31.8 | | 27.1 | | 33.0 | | 33.1 | 20.8 | 9.7 | 34.7 | 12.8 | |
| Level of Service | C | | C | | C | | C | C | A | C | B | |
| Approach Delay (s) | | 28.6 | | | 33.0 | | | 21.1 | | | 13.6 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.0 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 73.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1508 | 20 | 30 | 1398 | 0 | 20 |
| Future Volume (Veh/h) | 1508 | 20 | 30 | 1398 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1587 | 21 | 32 | 1472 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.86 | |
| vC, conflicting volume | | | 1608 | | 2142 | 794 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1608 | | 1771 | 794 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 402 | | 59 | 331 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 794 | 794 | 21 | 32 | 491 | 491 | 491 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 402 | 1700 | 1700 | 1700 | 331 |
| Volume to Capacity | 0.47 | 0.47 | 0.01 | 0.08 | 0.29 | 0.29 | 0.29 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.7 | 0.0 | 0.0 | 0.0 | 16.6 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.3 | | | | 16.6 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 51.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 396 | 753 | 0 | 0 | 788 | 610 | 12 | 0 | 775 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 396 | 753 | 0 | 0 | 788 | 610 | 12 | 0 | 775 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 417 | 793 | 0 | 0 | 829 | 642 | 13 | 0 | 816 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.93 | | | | | | 0.93 | 0.93 | | 0.93 | 0.93 | 0.93 |
| vC, conflicting volume | 829 | | | 793 | | | 2042 | 2456 | 793 | 2456 | 2456 | 414 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 678 | | | 793 | | | 1975 | 2418 | 793 | 2418 | 2418 | 234 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 52 | | | 100 | | | 41 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 864 | | | 837 | | | 22 | 16 | 1657 | 5 | 16 | 723 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 417 | 793 | 414 | 414 | 642 | 13 | 816 |
| Volume Left | 417 | 0 | 0 | 0 | 0 | 13 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 642 | 0 | 816 |
| cSH | 864 | 1700 | 1700 | 1700 | 1700 | 22 | 1657 |
| Volume to Capacity | 0.48 | 0.47 | 0.24 | 0.24 | 0.38 | 0.59 | 0.49 |
| Queue Length 95th (ft) | 67 | 0 | 0 | 0 | 0 | 43 | 71 |
| Control Delay (s) | 13.0 | 0.0 | 0.0 | 0.0 | 0.0 | 305.8 | 9.3 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 4.5 | | 0.0 | | | 13.9 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.8 | | |
| Intersection Capacity Utilization | 94.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 36 | 876 | 262 | 538 | 273 | 180 |
| Future Volume (Veh/h) | 36 | 876 | 262 | 538 | 273 | 180 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 38 | 922 | 276 | 566 | 287 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 276 | | | | 1274 | 276 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 276 | | | | 1274 | 276 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 0 | 75 |
| cM capacity (veh/h) | 1299 | | | | 180 | 768 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 960 | 276 | 566 | 287 | 189 |
| Volume Left | 38 | 0 | 0 | 287 | 0 |
| Volume Right | 0 | 0 | 566 | 0 | 189 |
| cSH | 1299 | 1700 | 1700 | 180 | 768 |
| Volume to Capacity | 0.03 | 0.16 | 0.33 | 1.59 | 0.25 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 476 | 24 |
| Control Delay (s) | 0.8 | 0.0 | 0.0 | 338.5 | 11.2 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.8 | 0.0 | | 208.5 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 43.9 | | |
| Intersection Capacity Utilization | 88.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 166 | 72 | 1 | 136 | 42 | 0 |
| Future Volume (Veh/h) | 166 | 72 | 1 | 136 | 42 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 175 | 76 | 1 | 143 | 44 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 251 | | 358 | 213 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 251 | | 358 | 213 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 93 | 100 |
| cM capacity (veh/h) | | | 1314 | | 640 | 827 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 251 | 144 | 44 |
| Volume Left | 0 | 1 | 44 |
| Volume Right | 76 | 0 | 0 |
| cSH | 1700 | 1314 | 640 |
| Volume to Capacity | 0.15 | 0.00 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 6 |
| Control Delay (s) | 0.0 | 0.1 | 11.0 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 11.0 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 23.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 32 | 190 | 10 | 22 | 250 |
| Future Volume (Veh/h) | 10 | 32 | 190 | 10 | 22 | 250 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 34 | 200 | 11 | 23 | 263 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 514 | 206 | | | 211 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 514 | 206 | | | 211 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 98 | |
| cM capacity (veh/h) | 511 | 835 | | | 1360 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 45 | 211 | 286 |
| Volume Left | 11 | 0 | 23 |
| Volume Right | 34 | 11 | 0 |
| cSH | 723 | 1700 | 1360 |
| Volume to Capacity | 0.06 | 0.12 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 1 |
| Control Delay (s) | 10.3 | 0.0 | 0.8 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.3 | 0.0 | 0.8 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.3 | | |
| Intersection Capacity Utilization | 38.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 2 | 20 | 2 | 2 | 20 |
| Future Volume (Veh/h) | 20 | 2 | 20 | 2 | 2 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 21 | 2 | 21 | 2 | 2 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 47 | 22 | | | 23 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 47 | 22 | | | 23 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 100 | | | 100 | |
| cM capacity (veh/h) | 962 | 1055 | | | 1592 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 23 | 23 | 23 |
| Volume Left | 21 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 969 | 1700 | 1592 |
| Volume to Capacity | 0.02 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 2 | 0 | 0 |
| Control Delay (s) | 8.8 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.8 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.1 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Cumulative Plus Project AM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 70 | 0 | 10 | 173 | 5 | 151 | 200 | 920 | 72 | 123 | 1490 | 290 |
| Future Volume (vph) | 70 | 0 | 10 | 173 | 5 | 151 | 200 | 920 | 72 | 123 | 1490 | 290 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.85 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1534 | 1534 | 1805 | 1608 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1534 | 1534 | 1805 | 1608 | | 3502 | 3574 | 1581 | 1805 | 5060 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 75 | 0 | 11 | 186 | 5 | 162 | 215 | 989 | 77 | 132 | 1602 | 312 |
| RTOR Reduction (vph) | 0 | 6 | 5 | 0 | 140 | 0 | 0 | 0 | 41 | 0 | 22 | 0 |
| Lane Group Flow (vph) | 75 | 0 | 0 | 186 | 27 | 0 | 215 | 989 | 36 | 132 | 1892 | 0 |
| Confl. Bikes (#/hr) | | | | | | | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 1% | 0% | 0% | 0% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 3.1 | 0.7 | 0.7 | 13.1 | 10.7 | | 8.1 | 36.7 | 36.7 | 9.9 | 38.5 | |
| Effective Green, g (s) | 3.1 | 0.7 | 0.7 | 13.1 | 10.7 | | 8.1 | 36.7 | 36.7 | 9.9 | 38.5 | |
| Actuated g/C Ratio | 0.04 | 0.01 | 0.01 | 0.17 | 0.14 | | 0.10 | 0.47 | 0.47 | 0.13 | 0.49 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 138 | 13 | 13 | 301 | 219 | | 362 | 1675 | 741 | 228 | 2487 | |
| v/s Ratio Prot | 0.02 | 0.00 | | c0.10 | c0.02 | | 0.06 | 0.28 | | c0.07 | c0.37 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.02 | | | |
| v/c Ratio | 0.54 | 0.00 | 0.00 | 0.62 | 0.12 | | 0.59 | 0.59 | 0.05 | 0.58 | 0.76 | |
| Uniform Delay, d1 | 36.9 | 38.5 | 38.5 | 30.3 | 29.7 | | 33.5 | 15.3 | 11.3 | 32.2 | 16.2 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 2.3 | 0.0 | 0.0 | 2.6 | 0.1 | | 1.7 | 0.6 | 0.0 | 2.2 | 1.4 | |
| Delay (s) | 39.2 | 38.5 | 38.5 | 32.9 | 29.8 | | 35.3 | 15.8 | 11.3 | 34.4 | 17.6 | |
| Level of Service | D | D | D | C | C | | D | B | B | C | B | |
| Approach Delay (s) | | 39.1 | | | 31.4 | | | 18.8 | | | 18.7 | |
| Approach LOS | | D | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.4 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.72 | | |
| Actuated Cycle Length (s) | 78.3 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 68.8% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1132 | 10 | 40 | 1373 | 260 |
| Future Volume (vph) | 20 | 0 | 90 | 40 | 0 | 40 | 360 | 1132 | 10 | 40 | 1373 | 260 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 0.99 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.93 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.98 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5053 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1714 | | 3502 | 3574 | 1582 | 1805 | 5053 | |
| Peak-hour factor, PHF | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Adj. Flow (vph) | 22 | 0 | 97 | 43 | 0 | 43 | 387 | 1217 | 11 | 43 | 1476 | 280 |
| RTOR Reduction (vph) | 0 | 0 | 92 | 0 | 82 | 0 | 0 | 0 | 4 | 0 | 18 | 0 |
| Lane Group Flow (vph) | 22 | 0 | 5 | 0 | 4 | 0 | 387 | 1217 | 7 | 43 | 1738 | 0 |
| Confl. Peds. (#/hr) | 1 | | | | | 1 | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | 1 | | | 1 | | | |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Effective Green, g (s) | 4.3 | | 4.3 | | 3.7 | | 12.3 | 46.0 | 46.0 | 4.1 | 37.8 | |
| Actuated g/C Ratio | 0.06 | | 0.06 | | 0.05 | | 0.16 | 0.60 | 0.60 | 0.05 | 0.50 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 101 | | 91 | | 83 | | 565 | 2157 | 955 | 97 | 2506 | |
| v/s Ratio Prot | c0.01 | | | | c0.00 | | c0.11 | 0.34 | | 0.02 | c0.34 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.00 | | | |
| v/c Ratio | 0.22 | | 0.06 | | 0.05 | | 0.68 | 0.56 | 0.01 | 0.44 | 0.69 | |
| Uniform Delay, d1 | 34.3 | | 34.0 | | 34.6 | | 30.1 | 9.1 | 6.0 | 34.9 | 14.7 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 0.4 | | 0.1 | | 0.1 | | 2.7 | 0.3 | 0.0 | 1.2 | 0.8 | |
| Delay (s) | 34.7 | | 34.1 | | 34.7 | | 32.9 | 9.4 | 6.0 | 36.1 | 15.6 | |
| Level of Service | C | | C | | C | | C | A | A | D | B | |
| Approach Delay (s) | | 34.2 | | | 34.7 | | | 15.0 | | | 16.1 | |
| Approach LOS | | C | | | C | | | B | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 16.6 | HCM 2000 Level of Service | B |
| HCM 2000 Volume to Capacity ratio | 0.62 | | |
| Actuated Cycle Length (s) | 76.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 66.3% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1482 | 10 | 0 | 1503 | 0 | 20 |
| Future Volume (Veh/h) | 1482 | 10 | 0 | 1503 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 1594 | 11 | 0 | 1616 | 0 | 22 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.75 | |
| vC, conflicting volume | | | 1605 | | 2138 | 537 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1605 | | 1368 | 537 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 95 |
| cM capacity (veh/h) | | | 403 | | 104 | 488 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 638 | 638 | 330 | 0 | 539 | 539 | 539 | 22 |
| Volume Left | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 22 |
| cSH | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 1700 | 488 |
| Volume to Capacity | 0.38 | 0.38 | 0.19 | 0.00 | 0.32 | 0.32 | 0.32 | 0.05 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.7 |
| Lane LOS | | | | | | | | B |
| Approach Delay (s) | 0.0 | | | 0.0 | | | | 12.7 |
| Approach LOS | | | | | | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.1 | | |
| Intersection Capacity Utilization | 38.9% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 166 | 731 | 0 | 0 | 1100 | 403 | 26 | 0 | 761 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 166 | 731 | 0 | 0 | 1100 | 403 | 26 | 0 | 761 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| 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 |
| Hourly flow rate (vph) | 178 | 786 | 0 | 0 | 1183 | 433 | 28 | 0 | 818 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.75 | | | | | | 0.75 | 0.75 | | 0.75 | 0.75 | 0.75 |
| vC, conflicting volume | 1183 | | | 786 | | | 1734 | 2325 | 786 | 2325 | 2325 | 592 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 585 | | | 786 | | | 1316 | 2103 | 786 | 2103 | 2103 | 0 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.8 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.7 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 76 | | | 100 | | | 55 | 100 | 51 | 100 | 100 | 100 |
| cM capacity (veh/h) | 747 | | | 842 | | | 62 | 30 | 1657 | 9 | 30 | 821 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 178 | 786 | 592 | 592 | 433 | 28 | 818 |
| Volume Left | 178 | 0 | 0 | 0 | 0 | 28 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 433 | 0 | 818 |
| cSH | 747 | 1700 | 1700 | 1700 | 1700 | 62 | 1657 |
| Volume to Capacity | 0.24 | 0.46 | 0.35 | 0.35 | 0.25 | 0.45 | 0.49 |
| Queue Length 95th (ft) | 23 | 0 | 0 | 0 | 0 | 44 | 71 |
| Control Delay (s) | 11.3 | 0.0 | 0.0 | 0.0 | 0.0 | 103.5 | 9.3 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 2.1 | | 0.0 | | | 12.4 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.6 | | |
| Intersection Capacity Utilization | 92.3% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 126 | 446 | 447 | 679 | 451 | 136 |
| Future Volume (Veh/h) | 126 | 446 | 447 | 679 | 451 | 136 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 135 | 480 | 481 | 730 | 485 | 146 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 481 | | | | 1231 | 481 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 481 | | | | 1231 | 481 |
| tC, single (s) | 4.1 | | | | 6.5 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.6 | 3.3 |
| p0 queue free % | 88 | | | | 0 | 75 |
| cM capacity (veh/h) | 1092 | | | | 166 | 589 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 615 | 481 | 730 | 485 | 146 |
| Volume Left | 135 | 0 | 0 | 485 | 0 |
| Volume Right | 0 | 0 | 730 | 0 | 146 |
| cSH | 1092 | 1700 | 1700 | 166 | 589 |
| Volume to Capacity | 0.12 | 0.28 | 0.43 | 2.92 | 0.25 |
| Queue Length 95th (ft) | 11 | 0 | 0 | 1100 | 24 |
| Control Delay (s) | 3.1 | 0.0 | 0.0 | 922.7 | 13.1 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 3.1 | 0.0 | | 712.2 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 183.7 | | |
| Intersection Capacity Utilization | 89.0% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 123 | 62 | 1 | 242 | 82 | 2 |
| Future Volume (Veh/h) | 123 | 62 | 1 | 242 | 82 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 132 | 67 | 1 | 260 | 88 | 2 |
| Pedestrians | 1 | | | 1 | | |
| Lane Width (ft) | 13.0 | | | 13.0 | | |
| Walking Speed (ft/s) | 4.0 | | | 4.0 | | |
| Percent Blockage | 0 | | | 0 | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 199 | | 428 | 166 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 199 | | 428 | 166 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 85 | 100 |
| cM capacity (veh/h) | | | 1373 | | 582 | 877 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 199 | 261 | 90 |
| Volume Left | 0 | 1 | 88 |
| Volume Right | 67 | 0 | 2 |
| cSH | 1700 | 1373 | 587 |
| Volume to Capacity | 0.12 | 0.00 | 0.15 |
| Queue Length 95th (ft) | 0 | 0 | 13 |
| Control Delay (s) | 0.0 | 0.0 | 12.2 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.0 | 12.2 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 2.0 | | |
| Intersection Capacity Utilization | 25.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 20 | 22 | 160 | 10 | 42 | 400 |
| Future Volume (Veh/h) | 20 | 22 | 160 | 10 | 42 | 400 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 22 | 24 | 172 | 11 | 45 | 430 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 698 | 178 | | | 183 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 698 | 178 | | | 183 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 94 | 97 | | | 97 | |
| cM capacity (veh/h) | 394 | 866 | | | 1392 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 46 | 183 | 475 |
| Volume Left | 22 | 0 | 45 |
| Volume Right | 24 | 11 | 0 |
| cSH | 550 | 1700 | 1392 |
| Volume to Capacity | 0.08 | 0.11 | 0.03 |
| Queue Length 95th (ft) | 7 | 0 | 3 |
| Control Delay (s) | 12.1 | 0.0 | 1.0 |
| Lane LOS | B | | A |
| Approach Delay (s) | 12.1 | 0.0 | 1.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 45.7% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Future Volume (Veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 | 0.93 |
| Hourly flow rate (vph) | 2 | 2 | 22 | 2 | 2 | 22 |
| Pedestrians | | | 1 | | | |
| Lane Width (ft) | | | 13.0 | | | |
| Walking Speed (ft/s) | | | 4.0 | | | |
| Percent Blockage | | | 0 | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 50 | 23 | | | 24 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 50 | 23 | | | 24 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 957 | 1054 | | | 1591 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 24 | 24 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1003 | 1700 | 1591 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.9 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# HCM Signalized Intersection Capacity Analysis
## 1: Sunol Blvd & Sycamore Rd

Cumulative Plus Project PM with Bypass

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 340 | 5 | 150 | 107 | 0 | 97 | 20 | 1510 | 134 | 132 | 860 | 60 |
| Future Volume (vph) | 340 | 5 | 150 | 107 | 0 | 97 | 20 | 1510 | 134 | 132 | 860 | 60 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 0.97 | 0.95 | 0.95 | 1.00 | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | 0.86 | 0.85 | 1.00 | 0.85 | | 1.00 | 1.00 | 0.85 | 1.00 | 0.99 | |
| Flt Protected | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5084 | |
| Flt Permitted | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 3502 | 1550 | 1534 | 1805 | 1615 | | 3502 | 3610 | 1575 | 1805 | 5084 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 358 | 5 | 158 | 113 | 0 | 102 | 21 | 1589 | 141 | 139 | 905 | 63 |
| RTOR Reduction (vph) | 0 | 73 | 73 | 0 | 97 | 0 | 0 | 0 | 77 | 0 | 5 | 0 |
| Lane Group Flow (vph) | 358 | 11 | 6 | 113 | 5 | 0 | 21 | 1589 | 64 | 139 | 963 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 6 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Turn Type | Prot | NA | Perm | Prot | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 7 | 4 | | 3 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 12.5 | 6.5 | 6.5 | 10.4 | 4.4 | | 2.0 | 38.0 | 38.0 | 10.8 | 46.8 | |
| Effective Green, g (s) | 12.5 | 6.5 | 6.5 | 10.4 | 4.4 | | 2.0 | 38.0 | 38.0 | 10.8 | 46.8 | |
| Actuated g/C Ratio | 0.15 | 0.08 | 0.08 | 0.12 | 0.05 | | 0.02 | 0.45 | 0.45 | 0.13 | 0.56 | |
| Clearance Time (s) | 4.0 | 4.2 | 4.2 | 4.0 | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 523 | 120 | 119 | 224 | 85 | | 83 | 1640 | 715 | 233 | 2846 | |
| v/s Ratio Prot | c0.10 | c0.01 | | 0.06 | 0.00 | | 0.01 | c0.44 | | c0.08 | 0.19 | |
| v/s Ratio Perm | | | 0.00 | | | | | | 0.04 | | | |
| v/c Ratio | 0.68 | 0.09 | 0.05 | 0.50 | 0.06 | | 0.25 | 0.97 | 0.09 | 0.60 | 0.34 | |
| Uniform Delay, d1 | 33.7 | 35.8 | 35.7 | 34.2 | 37.6 | | 40.1 | 22.2 | 13.0 | 34.3 | 10.0 | |
| Progression Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.0 | 0.1 | 0.1 | 0.7 | 0.1 | | 0.6 | 15.3 | 0.1 | 2.7 | 0.1 | |
| Delay (s) | 36.6 | 35.9 | 35.8 | 34.8 | 37.8 | | 40.7 | 37.5 | 13.0 | 37.1 | 10.1 | |
| Level of Service | D | D | D | C | D | | D | D | B | D | B | |
| Approach Delay (s) | | 36.4 | | | 36.2 | | | 35.6 | | | 13.5 | |
| Approach LOS | | D | | | D | | | D | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 28.9 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.79 | | |
| Actuated Cycle Length (s) | 83.6 | Sum of lost time (s) | 17.9 |
| Intersection Capacity Utilization | 77.0% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |
| c Critical Lane Group | | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1454 | 30 | 40 | 1057 | 20 |
| Future Volume (vph) | 170 | 0 | 360 | 20 | 0 | 40 | 60 | 1454 | 30 | 40 | 1057 | 20 |
| Ideal Flow (vphpl) | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 | 1900 |
| Total Lost time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Lane Util. Factor | 1.00 | | 1.00 | | 1.00 | | 0.97 | 0.95 | 1.00 | 1.00 | 0.91 | |
| Frpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 0.98 | 1.00 | 1.00 | |
| Flpb, ped/bikes | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Frt | 1.00 | | 0.85 | | 0.91 | | 1.00 | 1.00 | 0.85 | 1.00 | 1.00 | |
| Flt Protected | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (prot) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Flt Permitted | 0.95 | | 1.00 | | 0.98 | | 0.95 | 1.00 | 1.00 | 0.95 | 1.00 | |
| Satd. Flow (perm) | 1805 | | 1615 | | 1701 | | 3502 | 3610 | 1578 | 1805 | 5121 | |
| Peak-hour factor, PHF | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Adj. Flow (vph) | 179 | 0 | 379 | 21 | 0 | 42 | 63 | 1531 | 32 | 42 | 1113 | 21 |
| RTOR Reduction (vph) | 0 | 0 | 319 | 0 | 60 | 0 | 0 | 0 | 16 | 0 | 2 | 0 |
| Lane Group Flow (vph) | 179 | 0 | 60 | 0 | 3 | 0 | 63 | 1531 | 16 | 42 | 1132 | 0 |
| Confl. Peds. (#/hr) | | | | | | | | | | | | 1 |
| Confl. Bikes (#/hr) | | | | | | | | | 4 | | | 2 |
| Heavy Vehicles (%) | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% |
| Parking (#/hr) | | | | 10 | | 10 | | | | | | |
| Turn Type | Split | | Perm | Split | NA | | Prot | NA | Perm | Prot | NA | |
| Protected Phases | 4 | 4 | | 8 | 8 | | 5 | 2 | | 1 | 6 | |
| Permitted Phases | | | 4 | | | | | | 2 | | | |
| Actuated Green, G (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Effective Green, g (s) | 11.6 | | 11.6 | | 3.8 | | 4.5 | 35.8 | 35.8 | 3.9 | 35.2 | |
| Actuated g/C Ratio | 0.16 | | 0.16 | | 0.05 | | 0.06 | 0.49 | 0.49 | 0.05 | 0.48 | |
| Clearance Time (s) | 4.2 | | 4.2 | | 4.2 | | 4.0 | 5.7 | 5.7 | 4.0 | 5.7 | |
| Vehicle Extension (s) | 2.0 | | 2.0 | | 2.0 | | 2.0 | 3.0 | 3.0 | 2.0 | 3.0 | |
| Lane Grp Cap (vph) | 286 | | 255 | | 88 | | 215 | 1765 | 771 | 96 | 2462 | |
| v/s Ratio Prot | c0.10 | | | | c0.00 | | 0.02 | c0.42 | | c0.02 | 0.22 | |
| v/s Ratio Perm | | | 0.04 | | | | | | 0.01 | | | |
| v/c Ratio | 0.63 | | 0.24 | | 0.04 | | 0.29 | 0.87 | 0.02 | 0.44 | 0.46 | |
| Uniform Delay, d1 | 28.8 | | 26.9 | | 33.0 | | 32.8 | 16.6 | 9.7 | 33.6 | 12.7 | |
| Progression Factor | 1.00 | | 1.00 | | 1.00 | | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | |
| Incremental Delay, d2 | 3.1 | | 0.2 | | 0.1 | | 0.3 | 4.8 | 0.0 | 1.2 | 0.1 | |
| Delay (s) | 31.8 | | 27.1 | | 33.0 | | 33.1 | 21.4 | 9.7 | 34.7 | 12.8 | |
| Level of Service | C | | C | | C | | C | C | A | C | B | |
| Approach Delay (s) | | 28.6 | | | 33.0 | | | 21.6 | | | 13.6 | |
| Approach LOS | | C | | | C | | | C | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| HCM 2000 Control Delay | 20.2 | HCM 2000 Level of Service | C |
| HCM 2000 Volume to Capacity ratio | 0.73 | | |
| Actuated Cycle Length (s) | 73.2 | Sum of lost time (s) | 18.1 |
| Intersection Capacity Utilization | 64.5% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

c Critical Lane Group

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1524 | 20 | 30 | 1407 | 0 | 20 |
| Future Volume (Veh/h) | 1524 | 20 | 30 | 1407 | 0 | 20 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 1604 | 21 | 32 | 1481 | 0 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | 511 | | |
| pX, platoon unblocked | | | | | 0.86 | |
| vC, conflicting volume | | | 1625 | | 2162 | 802 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 1625 | | 1789 | 802 |
| tC, single (s) | | | 4.1 | | 6.8 | 6.9 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 92 | | 100 | 94 |
| cM capacity (veh/h) | | | 396 | | 57 | 327 |

| Direction, Lane # | EB 1 | EB 2 | EB 3 | WB 1 | WB 2 | WB 3 | WB 4 | NB 1 |
|---|---|---|---|---|---|---|---|---|
| Volume Total | 802 | 802 | 21 | 32 | 494 | 494 | 494 | 21 |
| Volume Left | 0 | 0 | 0 | 32 | 0 | 0 | 0 | 0 |
| Volume Right | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 21 |
| cSH | 1700 | 1700 | 1700 | 396 | 1700 | 1700 | 1700 | 327 |
| Volume to Capacity | 0.47 | 0.47 | 0.01 | 0.08 | 0.29 | 0.29 | 0.29 | 0.06 |
| Queue Length 95th (ft) | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 5 |
| Control Delay (s) | 0.0 | 0.0 | 0.0 | 14.9 | 0.0 | 0.0 | 0.0 | 16.8 |
| Lane LOS | | | | B | | | | C |
| Approach Delay (s) | 0.0 | | | 0.3 | | | | 16.8 |
| Approach LOS | | | | | | | | C |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 52.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Volume (veh/h) | 396 | 763 | 0 | 0 | 792 | 615 | 12 | 0 | 781 | 0 | 0 | 0 |
| Future Volume (Veh/h) | 396 | 763 | 0 | 0 | 792 | 615 | 12 | 0 | 781 | 0 | 0 | 0 |
| Sign Control | | Free | | | Free | | | Stop | | | Stop | |
| Grade | | 0% | | | 0% | | | 0% | | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 417 | 803 | 0 | 0 | 834 | 647 | 13 | 0 | 822 | 0 | 0 | 0 |
| Pedestrians | | | | | | | | | | | | |
| Lane Width (ft) | | | | | | | | | | | | |
| Walking Speed (ft/s) | | | | | | | | | | | | |
| Percent Blockage | | | | | | | | | | | | |
| Right turn flare (veh) | | | | | | | | | | | | |
| Median type | | None | | | None | | | | | | | |
| Median storage veh) | | | | | | | | | | | | |
| Upstream signal (ft) | | | | | 1165 | | | | | | | |
| pX, platoon unblocked | 0.93 | | | | | | 0.93 | 0.93 | | 0.93 | 0.93 | 0.93 |
| vC, conflicting volume | 834 | | | 803 | | | 2054 | 2471 | 803 | 2471 | 2471 | 417 |
| vC1, stage 1 conf vol | | | | | | | | | | | | |
| vC2, stage 2 conf vol | | | | | | | | | | | | |
| vCu, unblocked vol | 678 | | | 803 | | | 1986 | 2433 | 803 | 2433 | 2433 | 230 |
| tC, single (s) | 4.1 | | | 4.1 | | | 7.5 | 6.5 | *1.0 | 7.5 | 6.5 | 6.9 |
| tC, 2 stage (s) | | | | | | | | | | | | |
| tF (s) | 2.2 | | | 2.2 | | | 3.5 | 4.0 | *2.2 | 3.5 | 4.0 | 3.3 |
| p0 queue free % | 52 | | | 100 | | | 39 | 100 | 50 | 100 | 100 | 100 |
| cM capacity (veh/h) | 862 | | | 830 | | | 21 | 16 | 1657 | 5 | 16 | 726 |

| Direction, Lane # | EB 1 | EB 2 | WB 1 | WB 2 | WB 3 | NB 1 | NB 2 |
|---|---|---|---|---|---|---|---|
| Volume Total | 417 | 803 | 417 | 417 | 647 | 13 | 822 |
| Volume Left | 417 | 0 | 0 | 0 | 0 | 13 | 0 |
| Volume Right | 0 | 0 | 0 | 0 | 647 | 0 | 822 |
| cSH | 862 | 1700 | 1700 | 1700 | 1700 | 21 | 1657 |
| Volume to Capacity | 0.48 | 0.47 | 0.25 | 0.25 | 0.38 | 0.61 | 0.50 |
| Queue Length 95th (ft) | 67 | 0 | 0 | 0 | 0 | 44 | 72 |
| Control Delay (s) | 13.0 | 0.0 | 0.0 | 0.0 | 0.0 | 316.0 | 9.3 |
| Lane LOS | B | | | | | F | A |
| Approach Delay (s) | 4.5 | | 0.0 | | | 14.1 | |
| Approach LOS | | | | | | B | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 4.9 | | |
| Intersection Capacity Utilization | 95.2% | ICU Level of Service | F |
| Analysis Period (min) | 15 | | |

* User Entered Value

| Movement | EBL | EBT | WBT | WBR | SBL | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 36 | 877 | 263 | 541 | 282 | 180 |
| Future Volume (Veh/h) | 36 | 877 | 263 | 541 | 282 | 180 |
| Sign Control | | Free | Free | | Stop | |
| Grade | | 0% | 0% | | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 38 | 923 | 277 | 569 | 297 | 189 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | None | None | | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 277 | | | | 1276 | 277 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 277 | | | | 1276 | 277 |
| tC, single (s) | 4.1 | | | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 2.2 | | | | 3.5 | 3.3 |
| p0 queue free % | 97 | | | | 0 | 75 |
| cM capacity (veh/h) | 1298 | | | | 179 | 767 |

| Direction, Lane # | EB 1 | WB 1 | WB 2 | SB 1 | SB 2 |
|---|---|---|---|---|---|
| Volume Total | 961 | 277 | 569 | 297 | 189 |
| Volume Left | 38 | 0 | 0 | 297 | 0 |
| Volume Right | 0 | 0 | 569 | 0 | 189 |
| cSH | 1298 | 1700 | 1700 | 179 | 767 |
| Volume to Capacity | 0.03 | 0.16 | 0.33 | 1.66 | 0.25 |
| Queue Length 95th (ft) | 2 | 0 | 0 | 505 | 24 |
| Control Delay (s) | 0.8 | 0.0 | 0.0 | 363.9 | 11.2 |
| Lane LOS | A | | | F | B |
| Approach Delay (s) | 0.8 | 0.0 | | 226.8 | |
| Approach LOS | | | | F | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 48.4 | | |
| Intersection Capacity Utilization | 88.3% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 194 | 72 | 1 | 152 | 42 | 0 |
| Future Volume (Veh/h) | 194 | 72 | 1 | 152 | 42 | 0 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 204 | 76 | 1 | 160 | 44 | 0 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | 826 | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 280 | | 404 | 242 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 280 | | 404 | 242 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 93 | 100 |
| cM capacity (veh/h) | | | 1283 | | 602 | 797 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 280 | 161 | 44 |
| Volume Left | 0 | 1 | 44 |
| Volume Right | 76 | 0 | 0 |
| cSH | 1700 | 1283 | 602 |
| Volume to Capacity | 0.16 | 0.00 | 0.07 |
| Queue Length 95th (ft) | 0 | 0 | 6 |
| Control Delay (s) | 0.0 | 0.1 | 11.4 |
| Lane LOS | | A | B |
| Approach Delay (s) | 0.0 | 0.1 | 11.4 |
| Approach LOS | | | B |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 24.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 32 | 190 | 10 | 22 | 250 |
| Future Volume (Veh/h) | 10 | 32 | 190 | 10 | 22 | 250 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 11 | 34 | 200 | 11 | 23 | 263 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 514 | 206 | | | 211 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 514 | 206 | | | 211 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 98 | 96 | | | 98 | |
| cM capacity (veh/h) | 511 | 835 | | | 1360 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 45 | 211 | 286 |
| Volume Left | 11 | 0 | 23 |
| Volume Right | 34 | 11 | 0 |
| cSH | 723 | 1700 | 1360 |
| Volume to Capacity | 0.06 | 0.12 | 0.02 |
| Queue Length 95th (ft) | 5 | 0 | 1 |
| Control Delay (s) | 10.3 | 0.0 | 0.8 |
| Lane LOS | B | | A |
| Approach Delay (s) | 10.3 | 0.0 | 0.8 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.3 | | |
| Intersection Capacity Utilization | 38.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | WBL | WBR | NBT | NBR | SBL | SBT |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Future Volume (Veh/h) | 2 | 2 | 20 | 2 | 2 | 20 |
| Sign Control | Stop | | Free | | | Free |
| Grade | 0% | | 0% | | | 0% |
| Peak Hour Factor | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 | 0.95 |
| Hourly flow rate (vph) | 2 | 2 | 21 | 2 | 2 | 21 |
| Pedestrians | | | | | | |
| Lane Width (ft) | | | | | | |
| Walking Speed (ft/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | None | | | None |
| Median storage veh) | | | | | | |
| Upstream signal (ft) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 47 | 22 | | | 23 | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 47 | 22 | | | 23 | |
| tC, single (s) | 6.4 | 6.2 | | | 4.1 | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | | | 2.2 | |
| p0 queue free % | 100 | 100 | | | 100 | |
| cM capacity (veh/h) | 962 | 1055 | | | 1592 | |

| Direction, Lane # | WB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 4 | 23 | 23 |
| Volume Left | 2 | 0 | 2 |
| Volume Right | 2 | 2 | 0 |
| cSH | 1006 | 1700 | 1592 |
| Volume to Capacity | 0.00 | 0.01 | 0.00 |
| Queue Length 95th (ft) | 0 | 0 | 0 |
| Control Delay (s) | 8.6 | 0.0 | 0.6 |
| Lane LOS | A | | A |
| Approach Delay (s) | 8.6 | 0.0 | 0.6 |
| Approach LOS | A | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

# APPENDIX C: SIGNAL WARRANT ANALYSIS

FEHR PEERS

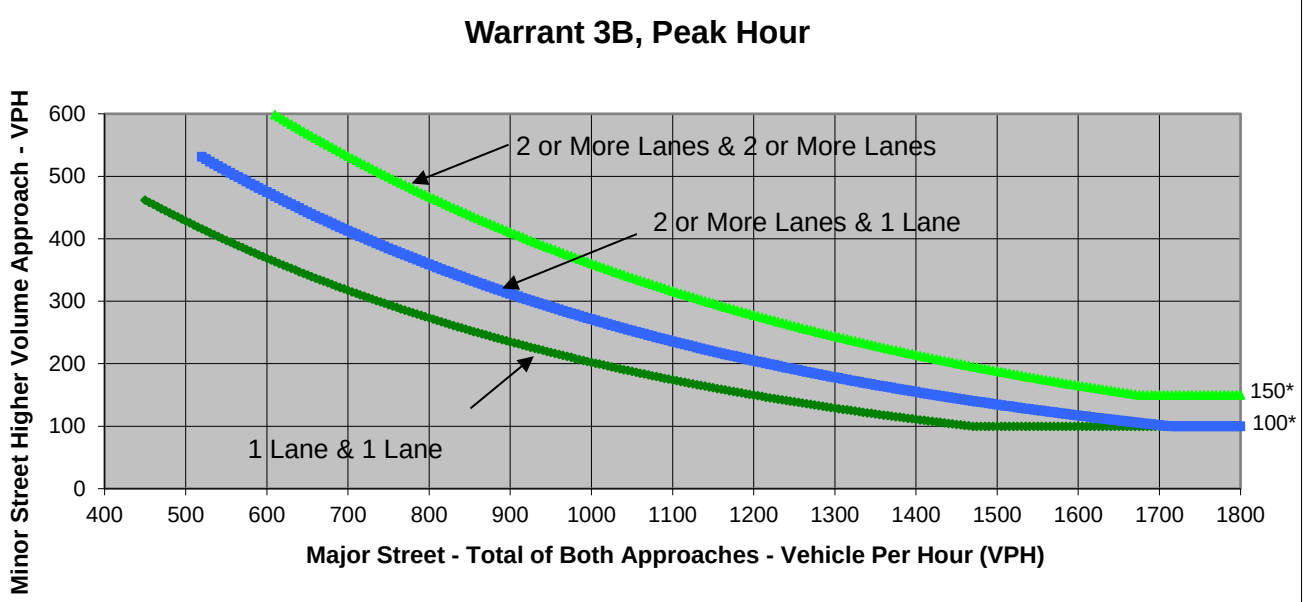
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Conditions_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 17 | 0 | 95 | 0 |
| Through | 1 | 0 | 174 | 1,393 |
| Right | 0 | 0 | 0 | 186 |
| Total | 18 | 0 | 269 | 1,579 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,848** | **18** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

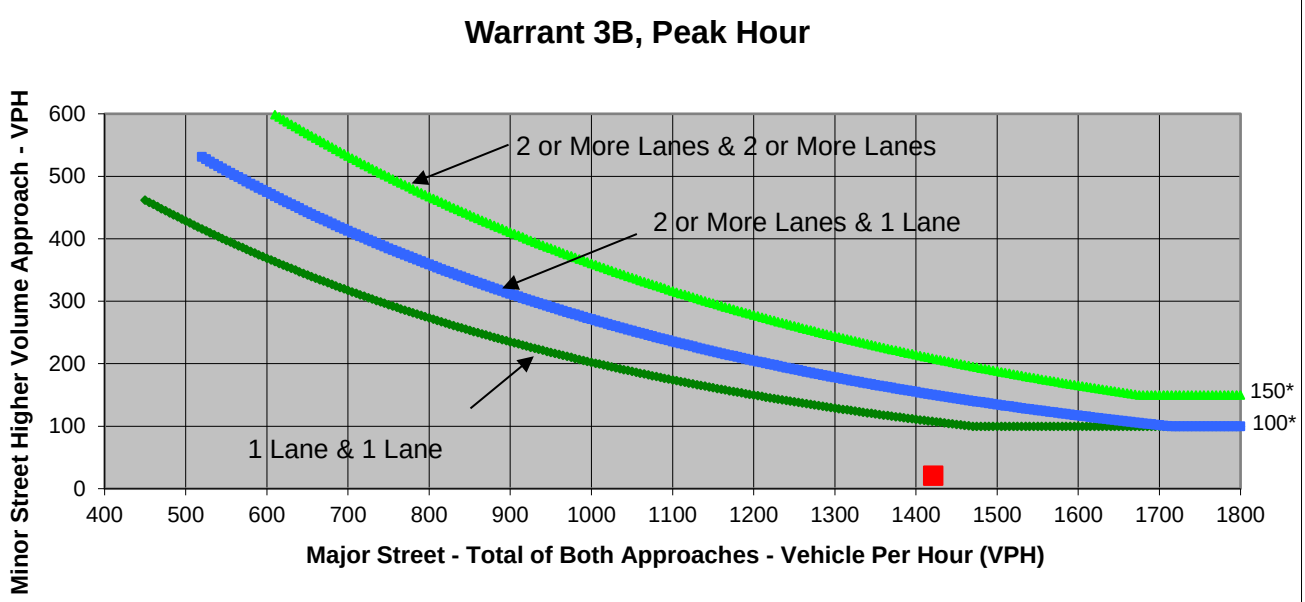
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Conditions_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 19 | 0 | 284 | 0 |
| Through | 2 | 0 | 562 | 370 |
| Right | 0 | 0 | 0 | 205 |
| Total | 21 | 0 | 846 | 575 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,421** | **21** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

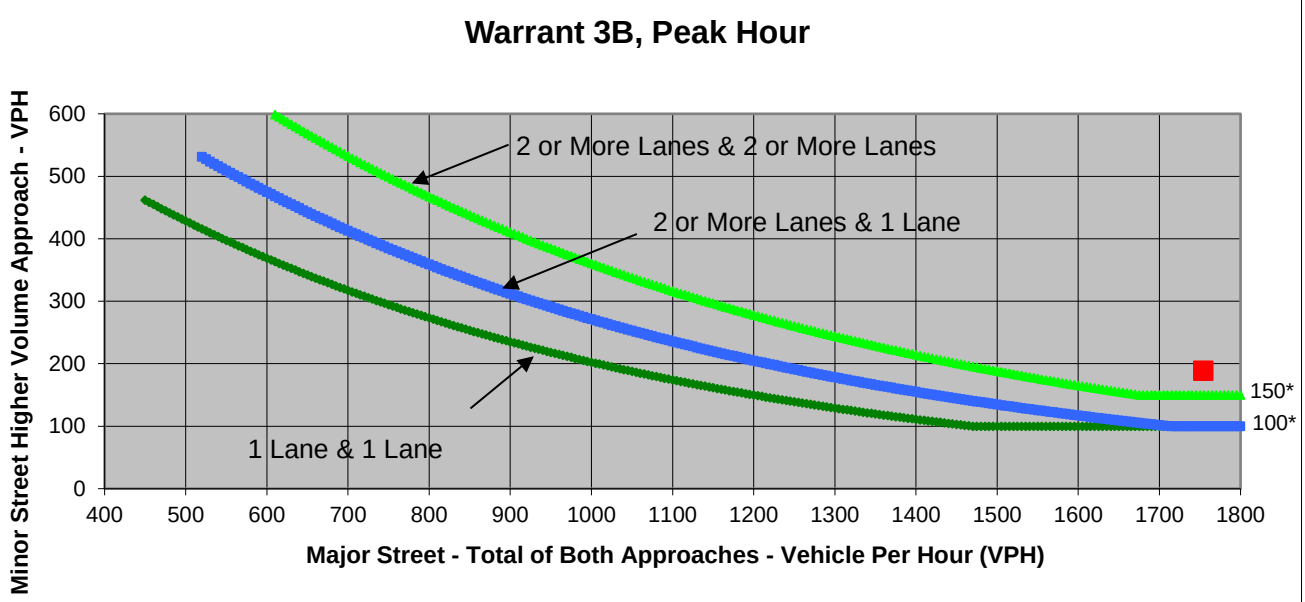
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Conditions_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 65 | 138 | 0 |
| Through | 0 | 0 | 206 | 415 |
| Right | 0 | 124 | 0 | 995 |
| Total | 0 | 189 | 344 | 1,410 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,754** | **189** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

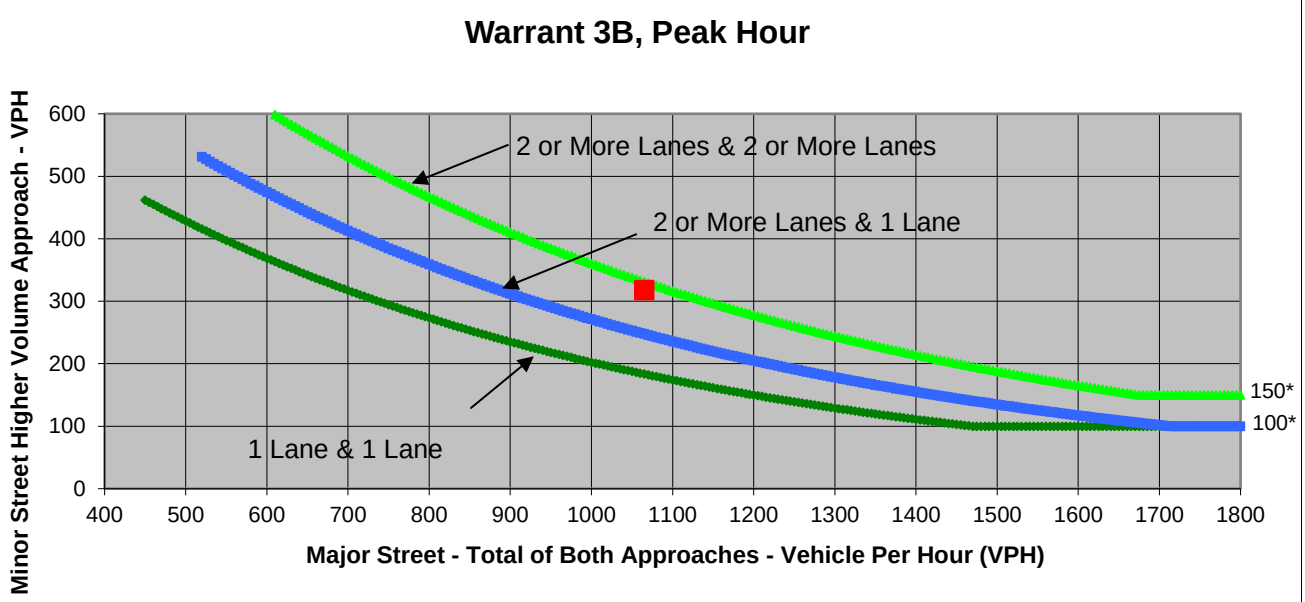
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Conditions_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 188 | 18 | 0 |
| Through | 0 | 0 | 658 | 177 |
| Right | 0 | 130 | 0 | 212 |
| Total | 0 | 318 | 676 | 389 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,065** | **318** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

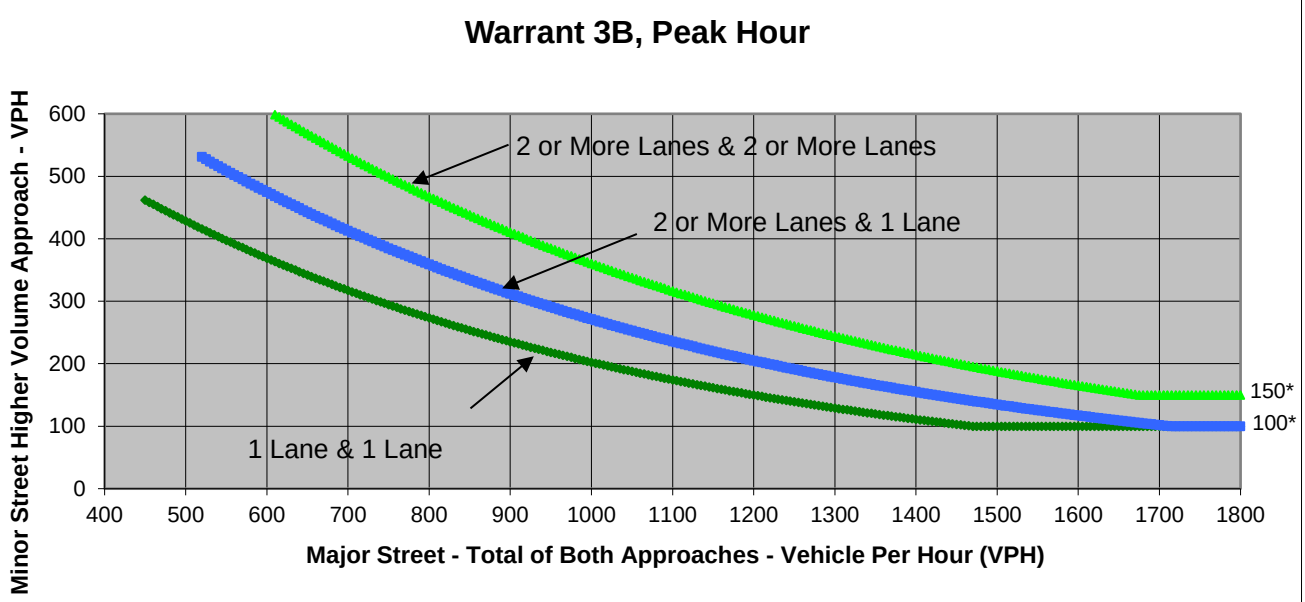
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 17 | 0 | 100 | 0 |
| Through | 1 | 0 | 175 | 1,393 |
| Right | 0 | 0 | 0 | 191 |
| Total | 18 | 0 | 275 | 1,584 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,859** | **18** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

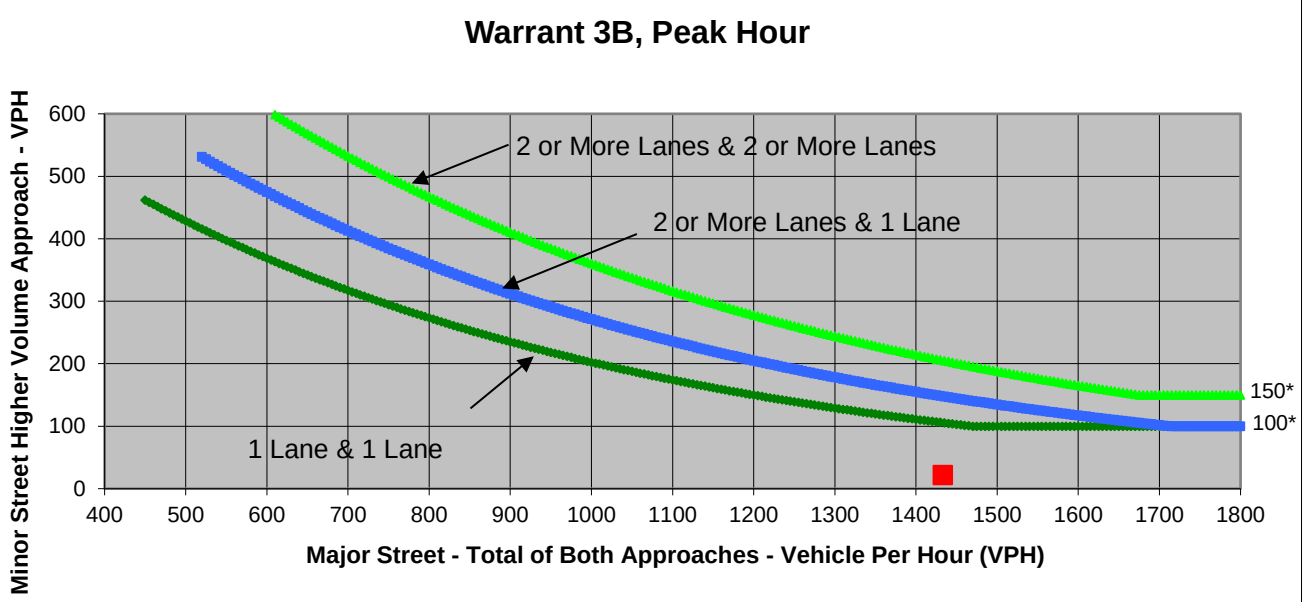
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 20 | 0 | 287 | 0 |
| Through | 2 | 0 | 566 | 372 |
| Right | 0 | 0 | 0 | 208 |
| Total | 22 | 0 | 853 | 580 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,433** | **22** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

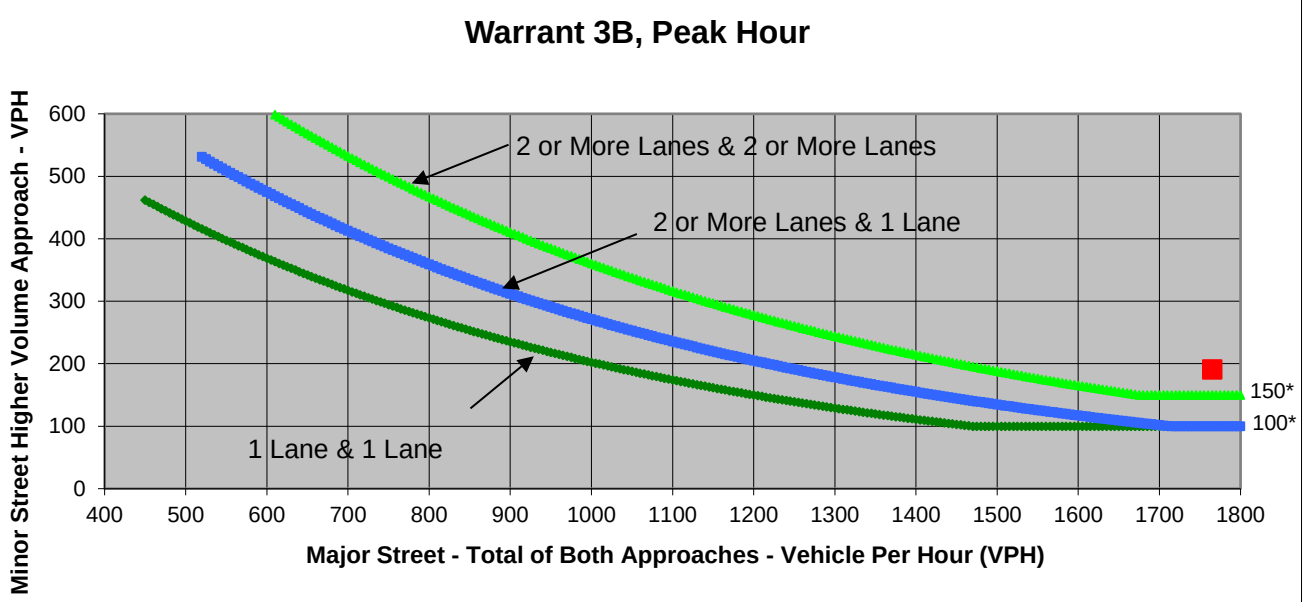
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 66 | 141 | 0 |
| Through | 0 | 0 | 211 | 415 |
| Right | 0 | 125 | 0 | 998 |
| Total | 0 | 191 | 352 | 1,413 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,765** | **191** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

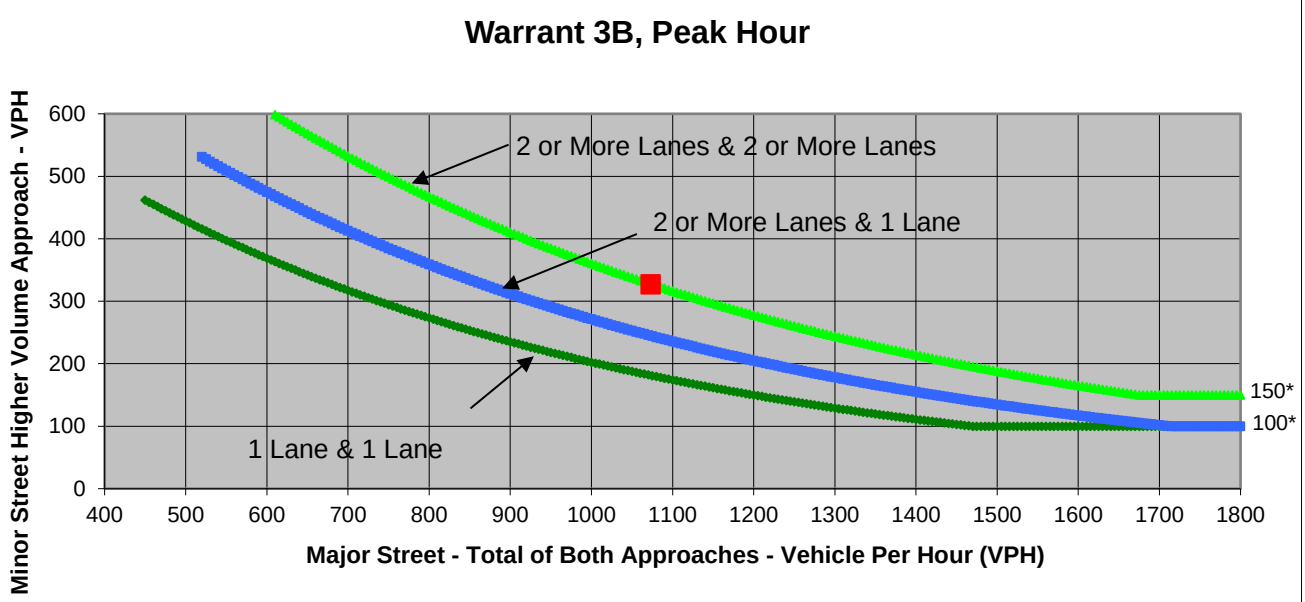
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 192 | 20 | 0 |
| Through | 0 | 0 | 661 | 178 |
| Right | 0 | 135 | 0 | 214 |
| Total | 0 | 327 | 681 | 392 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,073** | **327** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

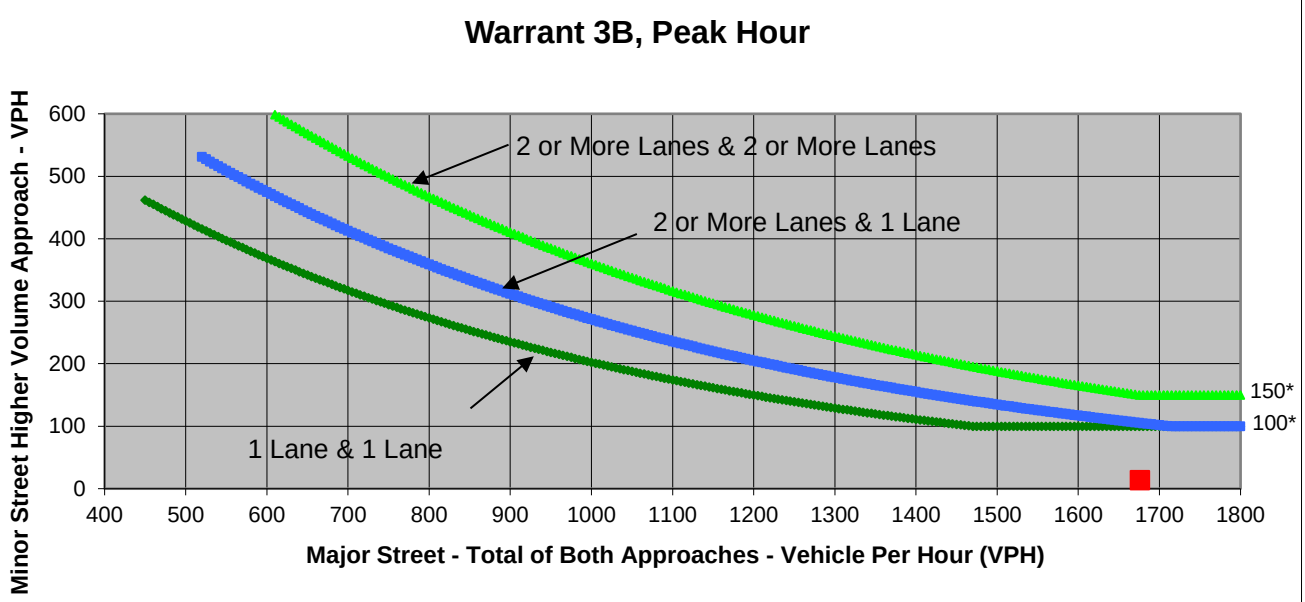
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Plus Project_With Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 13 | 0 | 90 | 0 |
| Through | 1 | 0 | 178 | 1,404 |
| Right | 0 | 0 | 0 | 4 |
| Total | 14 | 0 | 268 | 1,408 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,676** | **14** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

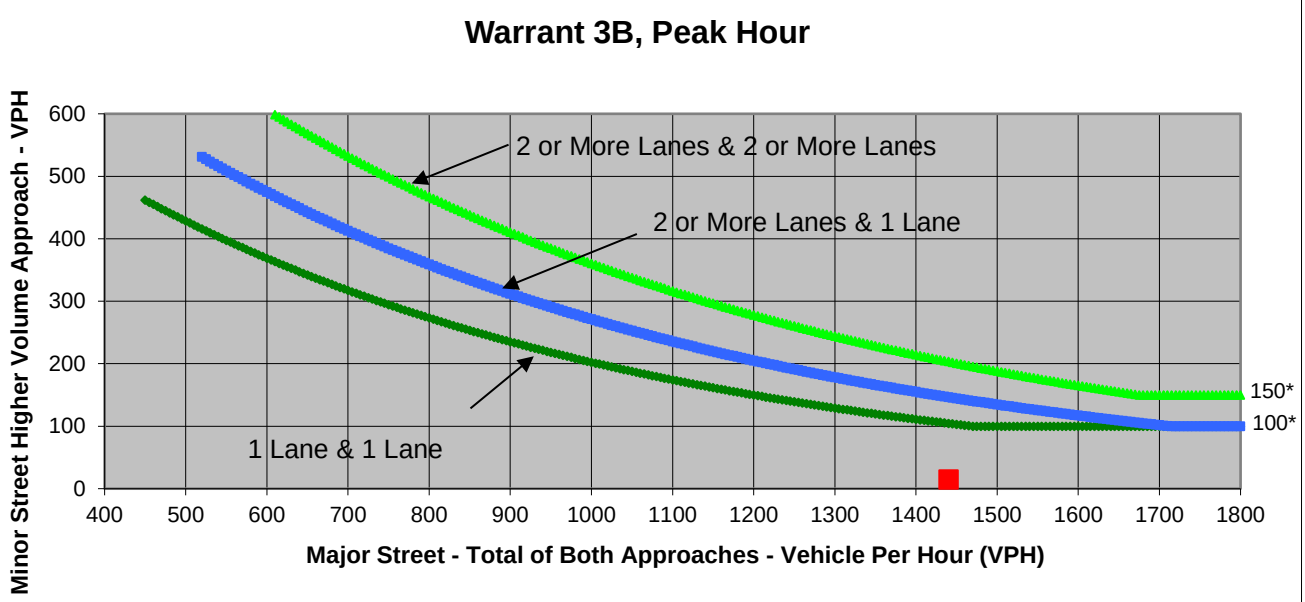
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Existing Plus Project_With Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 13 | 0 | 281 | 0 |
| Through | 2 | 0 | 569 | 377 |
| Right | 0 | 0 | 0 | 213 |
| Total | 15 | 0 | 850 | 590 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **1,440** | **15** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

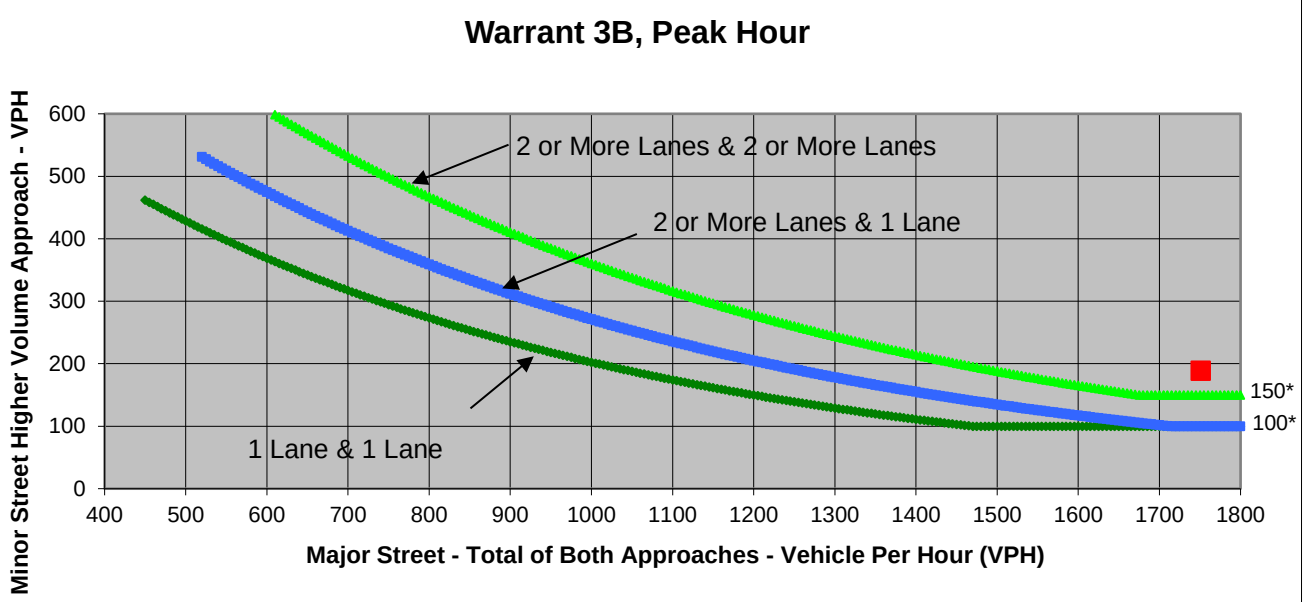
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Plus Project_With Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 69 | 133 | 0 |
| Through | 0 | 0 | 201 | 412 |
| Right | 0 | 120 | 0 | 1,005 |
| Total | 0 | 189 | 334 | 1,417 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,751** | **189** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

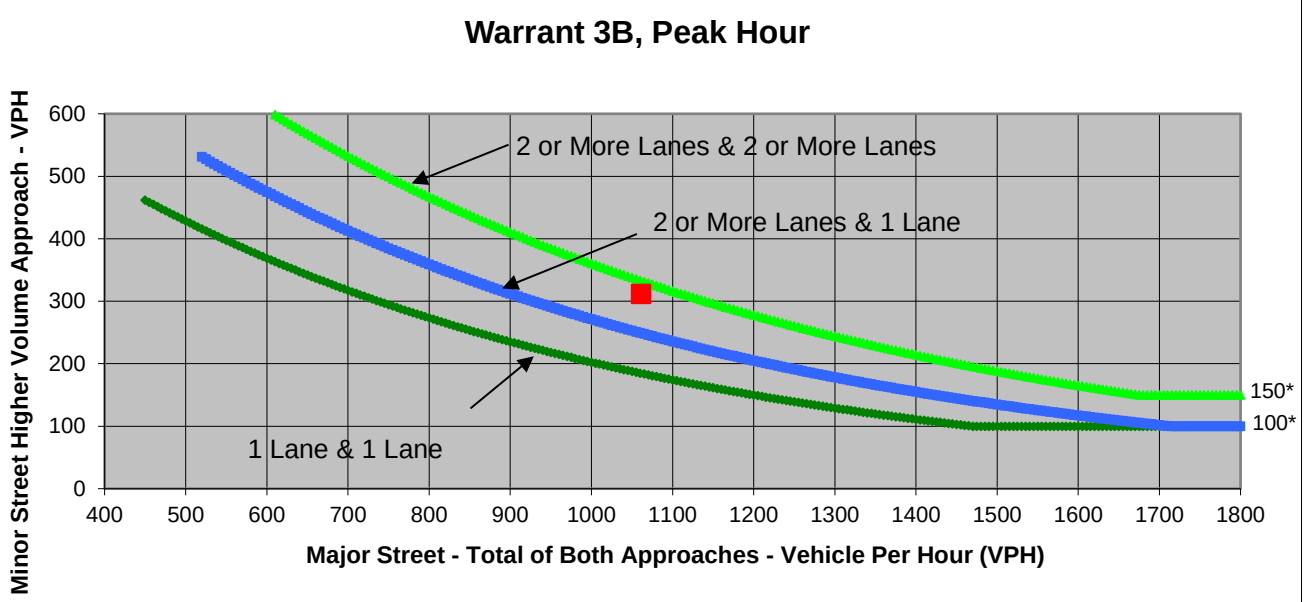
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Existing Plus Project_With Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 194 | 15 | 0 |
| Through | 0 | 0 | 656 | 172 |
| Right | 0 | 118 | 0 | 218 |
| Total | 0 | 312 | 671 | 390 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,061** | **312** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

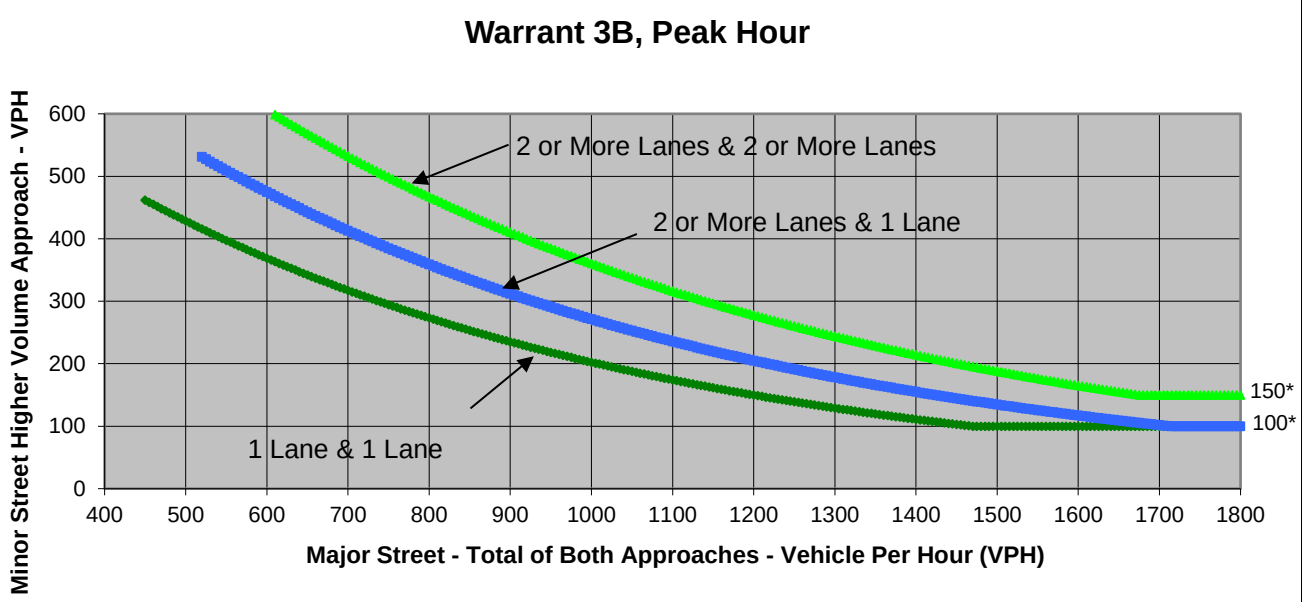
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term No Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 20 | 0 | 120 | 0 |
| Through | 0 | 0 | 610 | 1,080 |
| Right | 0 | 0 | 0 | 360 |
| Total | 20 | 0 | 730 | 1,440 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,170** | **20** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

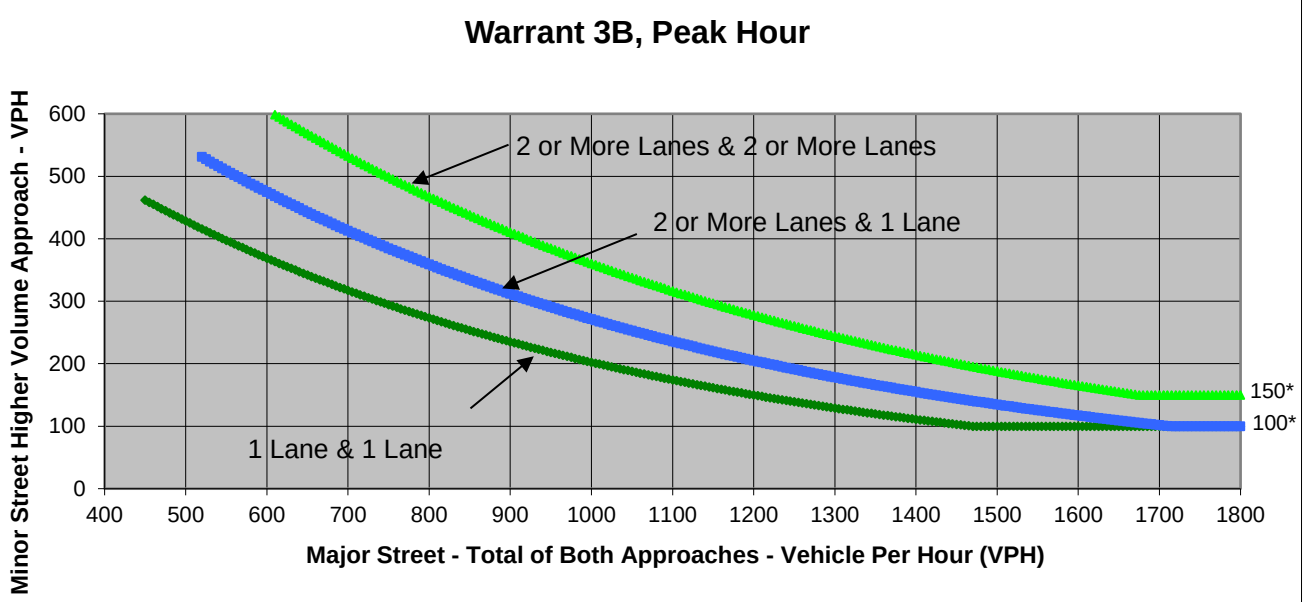
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term No Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 20 | 0 | 330 | 0 |
| Through | 0 | 0 | 700 | 430 |
| Right | 0 | 0 | 0 | 580 |
| Total | 20 | 0 | 1,030 | 1,010 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,040** | **20** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

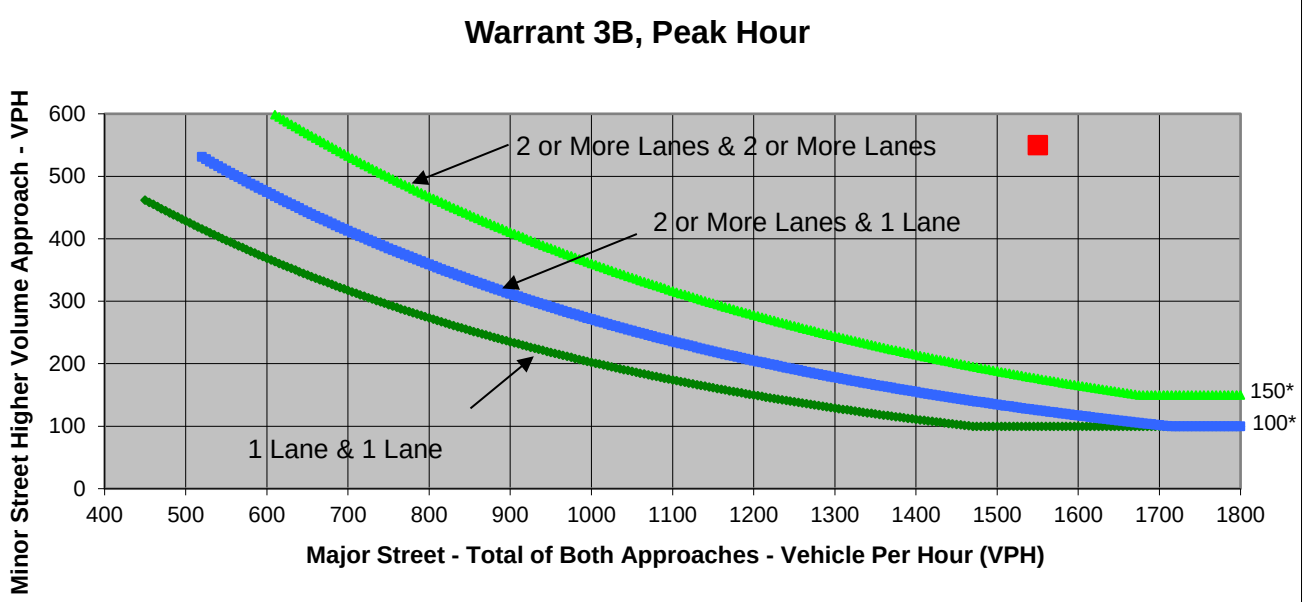
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Near Term No Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 420 | 140 | 0 |
| Through | 0 | 0 | 310 | 440 |
| Right | 0 | 130 | 0 | 660 |
| Total | 0 | 550 | 450 | 1,100 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,550** | **550** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

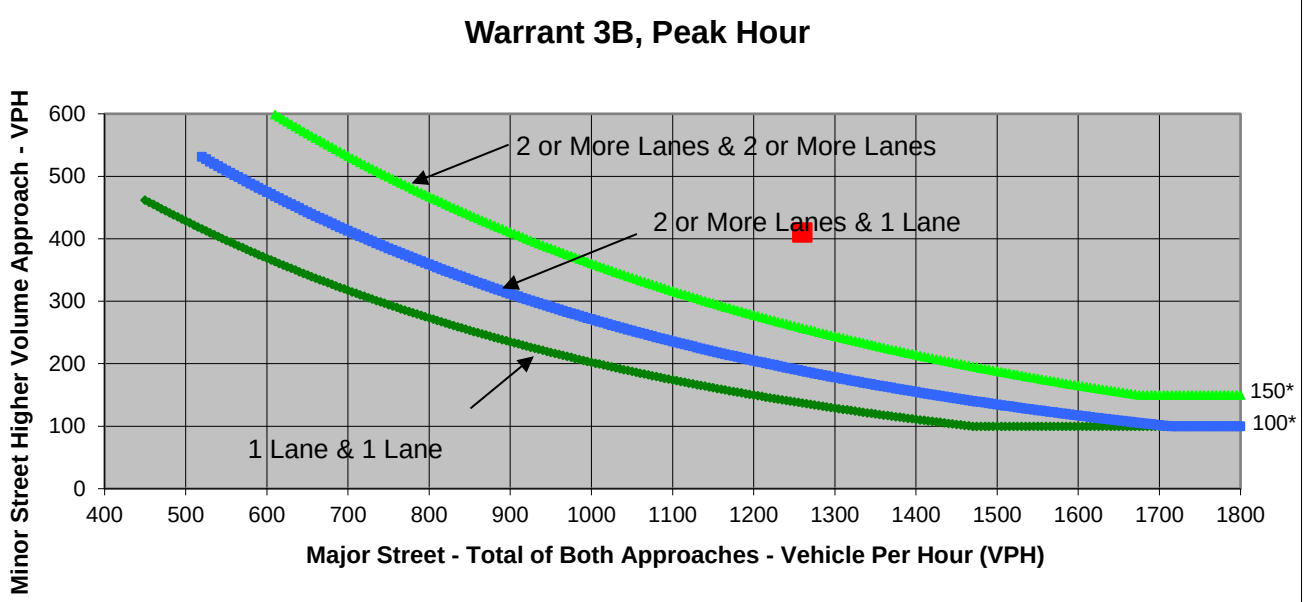
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Near Term No Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 250 | 30 | 0 |
| Through | 0 | 0 | 780 | 190 |
| Right | 0 | 160 | 0 | 260 |
| Total | 0 | 410 | 810 | 450 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,260** | **410** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

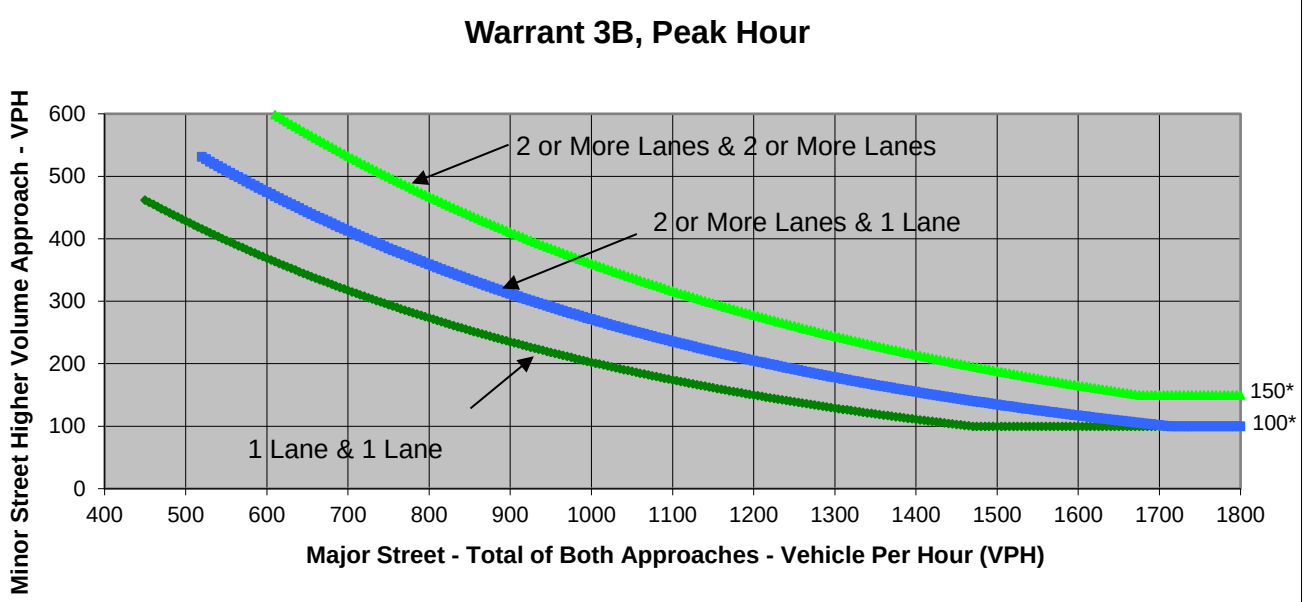
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 20 | 0 | 125 | 0 |
| Through | 0 | 0 | 611 | 1,083 |
| Right | 0 | 0 | 0 | 365 |
| Total | 20 | 0 | 736 | 1,448 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,184** | **20** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

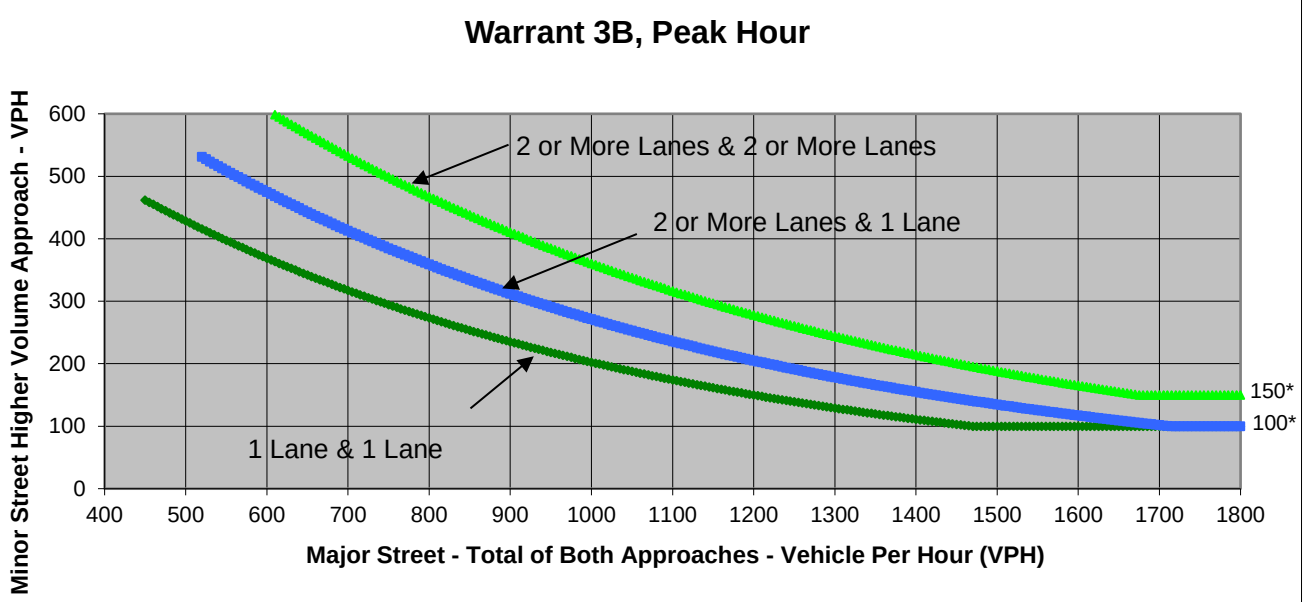
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 21 | 0 | 333 | 0 |
| Through | 0 | 0 | 704 | 432 |
| Right | 0 | 0 | 0 | 583 |
| Total | 21 | 0 | 1,037 | 1,015 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,052** | **21** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

| | |
|---|---|
| Major Street | Sunol Boulevard |
| Minor Street | I-680 SB Ramps |

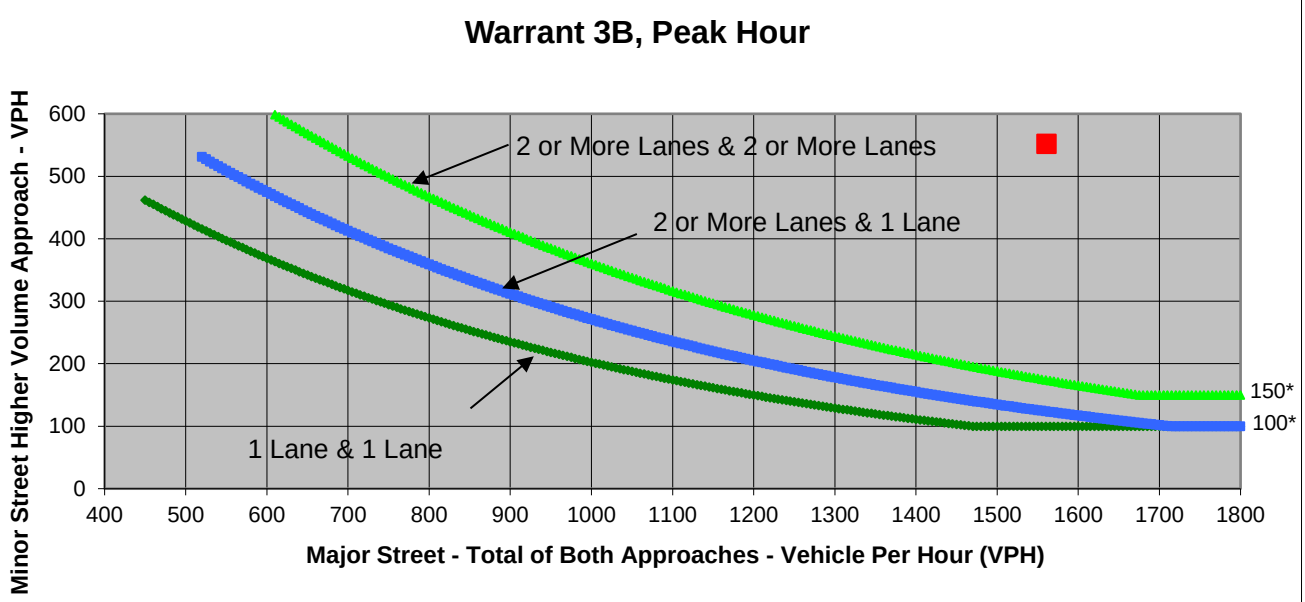
| | |
|---|---|
| Project | Spotorno Ranch EIR |
| Scenario | Near Term Plus Project_No Bypass |
| Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 421 | 143 | 0 |
| Through | 0 | 0 | 315 | 440 |
| Right | 0 | 131 | 0 | 663 |
| Total | 0 | 552 | 458 | 1,103 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,561** | **552** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

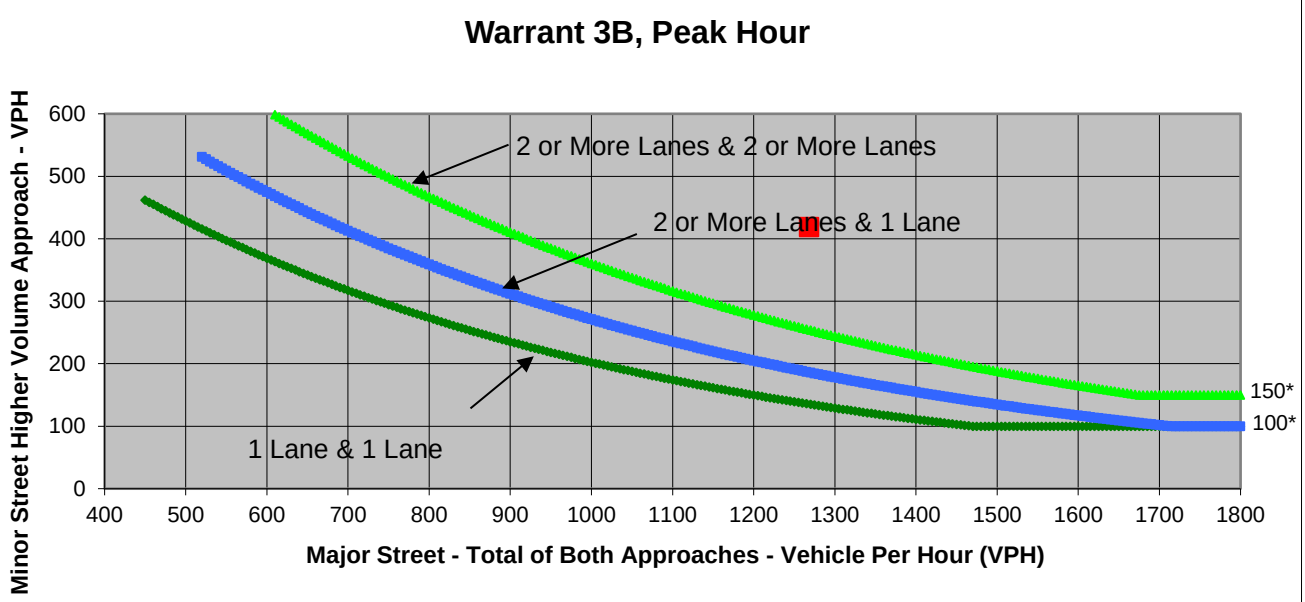
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 254 | 32 | 0 |
| Through | 0 | 0 | 783 | 191 |
| Right | 0 | 165 | 0 | 262 |
| Total | 0 | 419 | 815 | 453 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,268** | **419** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

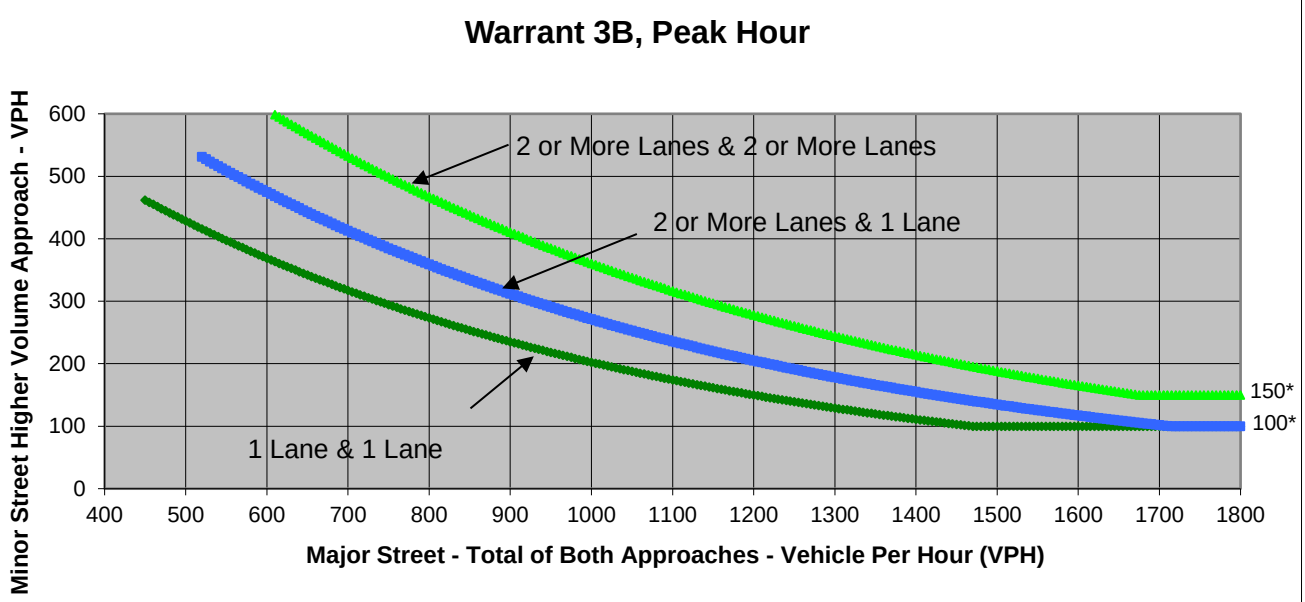
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 12 | 0 | 316 | 0 |
| Through | 0 | 0 | 714 | 442 |
| Right | 0 | 0 | 0 | 595 |
| Total | 12 | 0 | 1,030 | 1,037 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,067** | **12** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

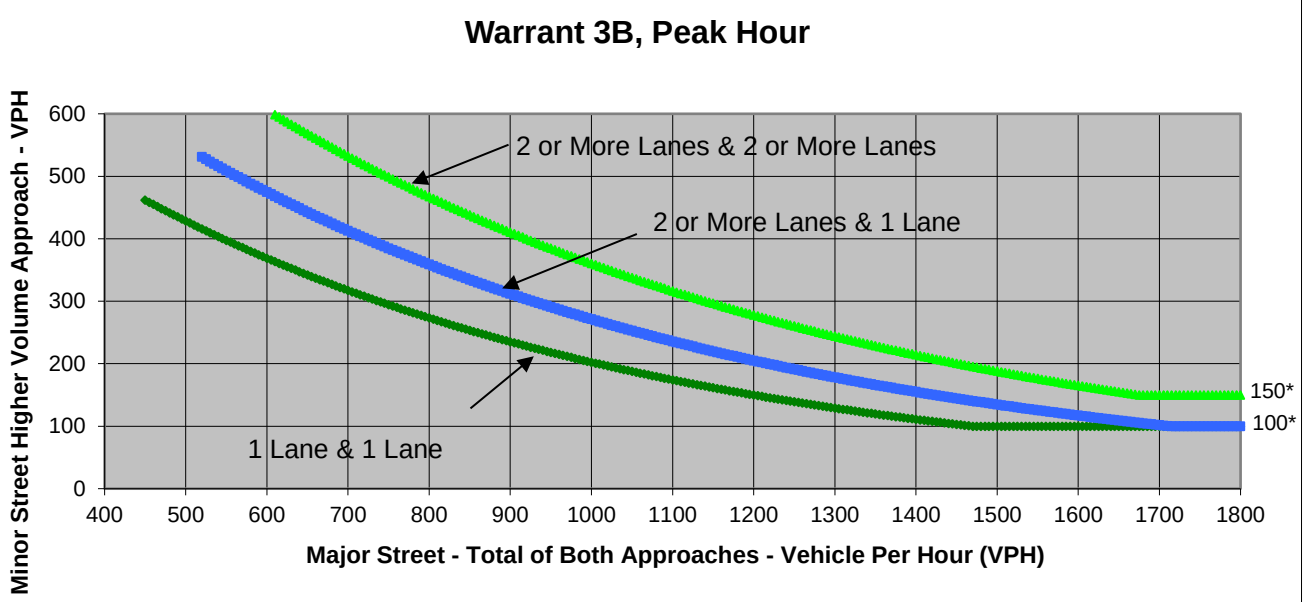
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 12 | 0 | 316 | 0 |
| Through | 0 | 0 | 714 | 442 |
| Right | 0 | 0 | 0 | 595 |
| Total | 12 | 0 | 1,030 | 1,037 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,067** | **12** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

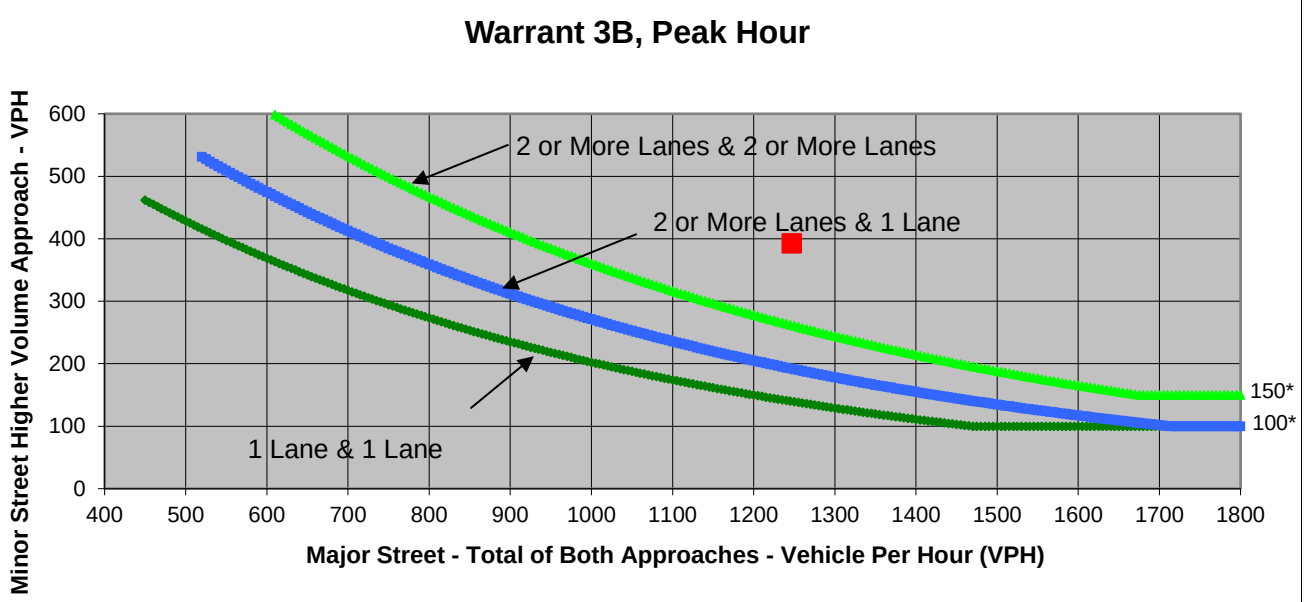
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Near Term Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 263 | 26 | 0 |
| Through | 0 | 0 | 767 | 183 |
| Right | 0 | 130 | 0 | 271 |
| Total | 0 | 393 | 793 | 454 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,247** | **393** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

| | |
|---|---|
| Major Street | Sunol Boulevard |
| Minor Street | I-680 SB Ramps |

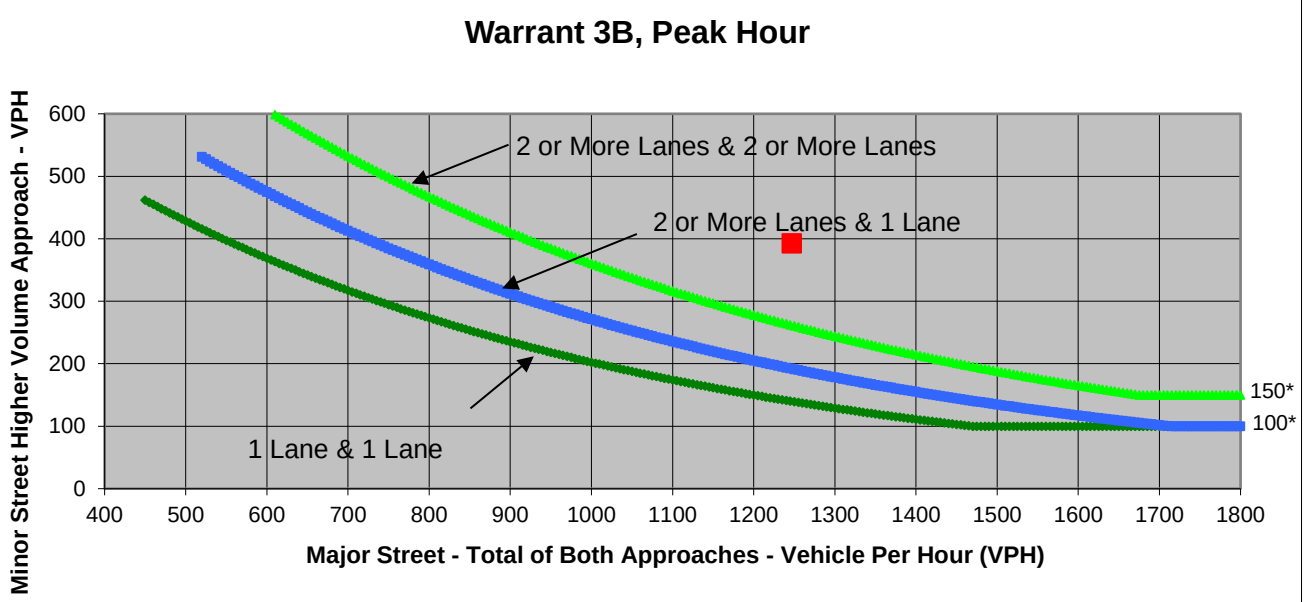
| | |
|---|---|
| Project | Spotorno Ranch EIR |
| Scenario | Near Term Plus Project_No Bypass |
| Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 263 | 26 | 0 |
| Through | 0 | 0 | 767 | 183 |
| Right | 0 | 130 | 0 | 271 |
| Total | 0 | 393 | 793 | 454 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,247** | **393** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

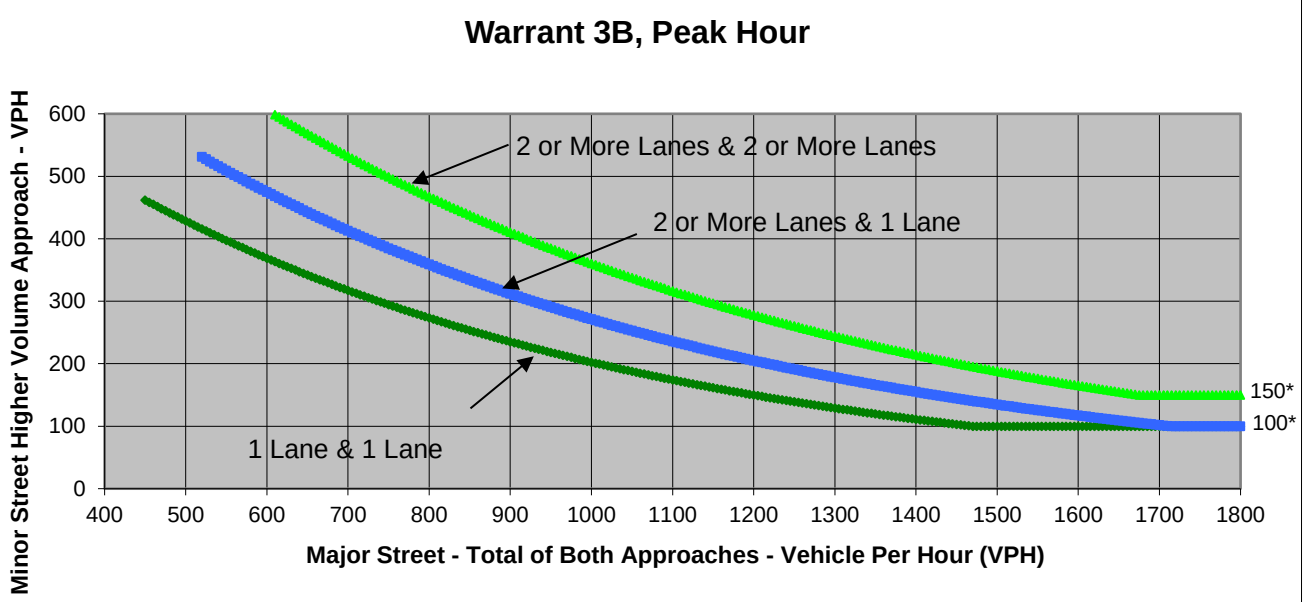
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative No Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 30 | 0 | 180 | 0 |
| Through | 0 | 0 | 720 | 1,080 |
| Right | 0 | 0 | 0 | 380 |
| Total | 30 | 0 | 900 | 1,460 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,360** | **30** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

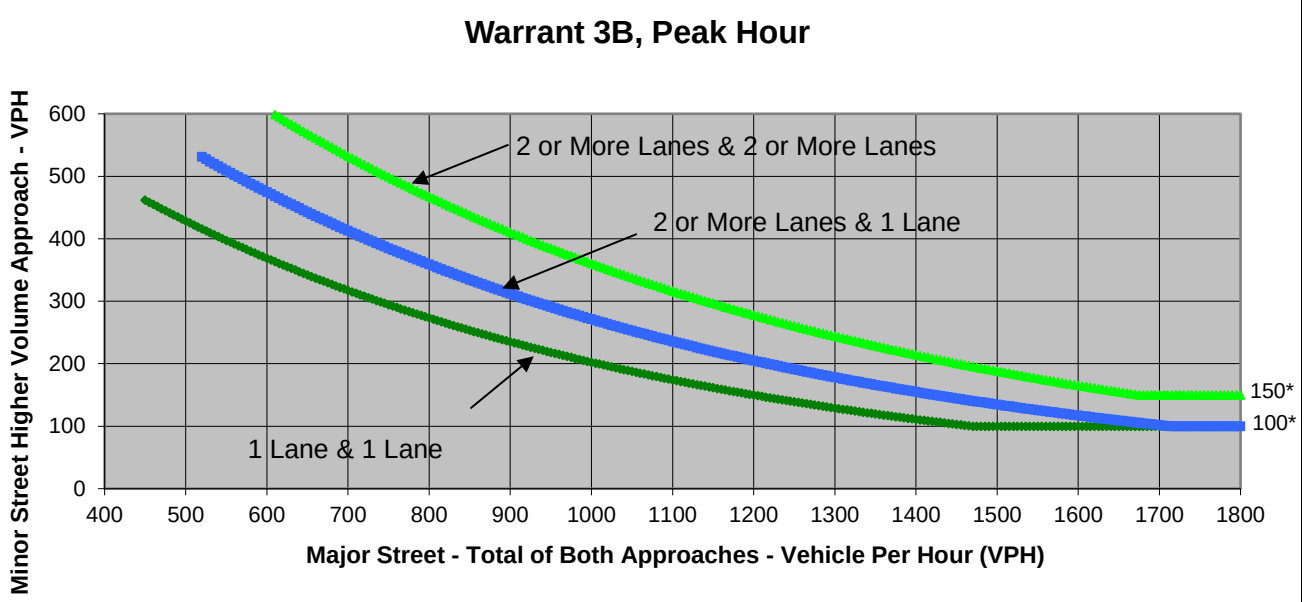
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative No Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 20 | 0 | 410 | 0 |
| Through | 0 | 0 | 740 | 780 |
| Right | 0 | 0 | 0 | 600 |
| Total | 20 | 0 | 1,150 | 1,380 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,530** | **20** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

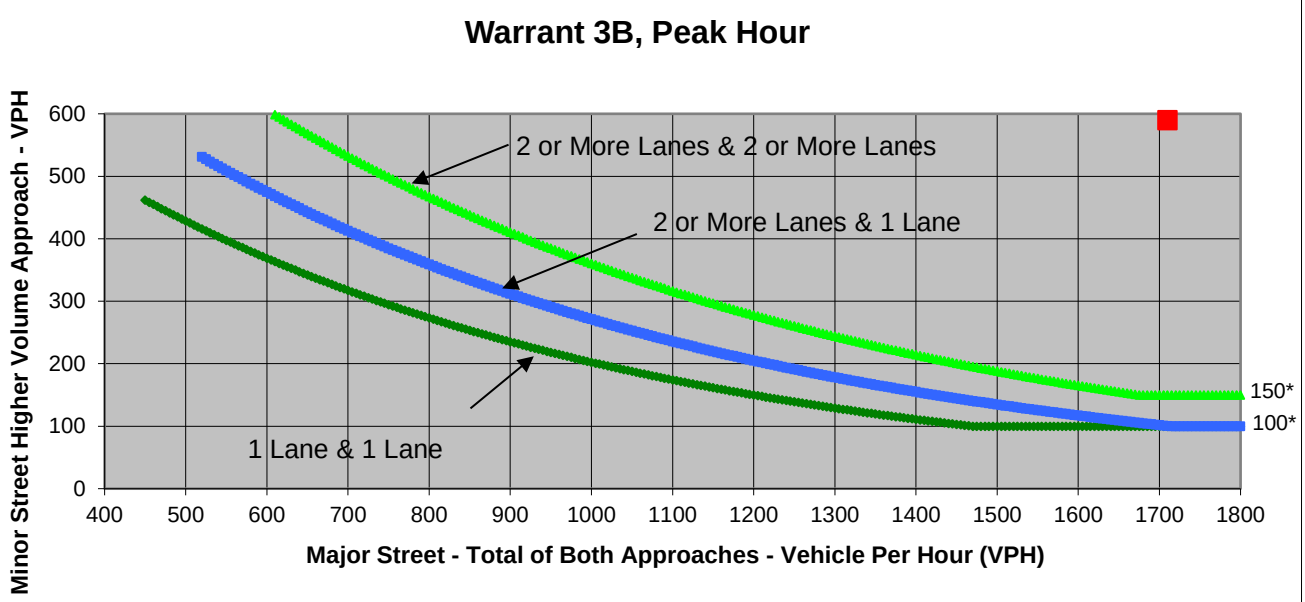
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Cumulative No Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 440 | 140 | 0 |
| Through | 0 | 0 | 460 | 450 |
| Right | 0 | 150 | 0 | 660 |
| Total | 0 | 590 | 600 | 1,110 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,710** | **590** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

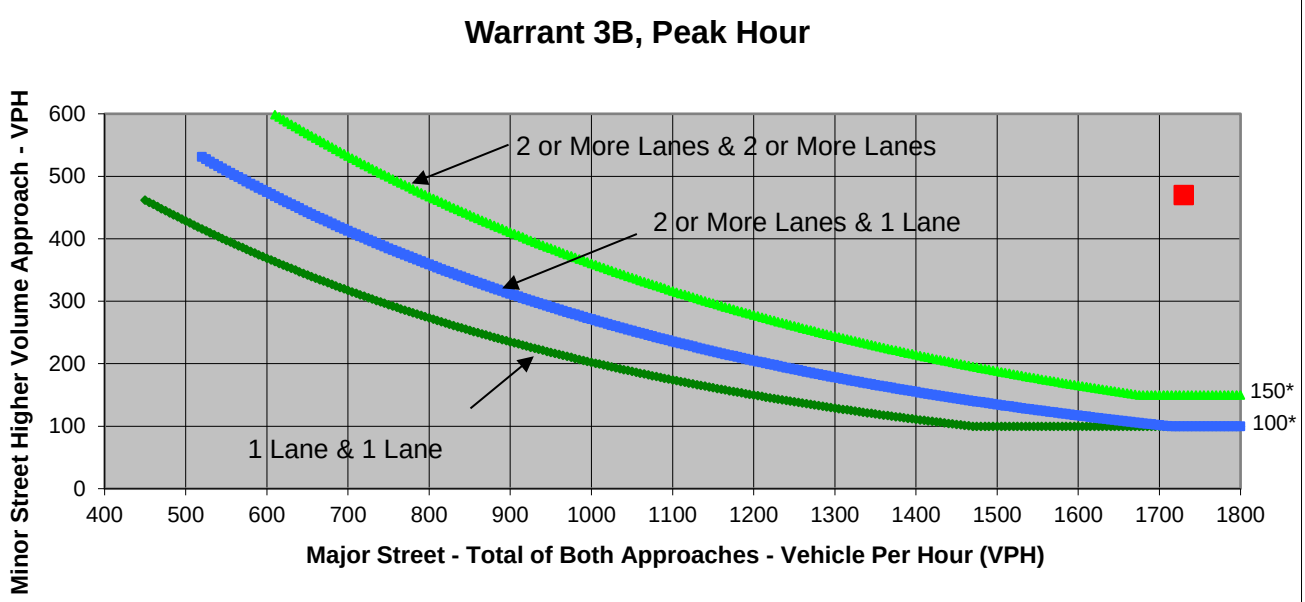
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Cumulative No Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 260 | 40 | 0 |
| Through | 0 | 0 | 890 | 270 |
| Right | 0 | 210 | 0 | 530 |
| Total | 0 | 470 | 930 | 800 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,730** | **470** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

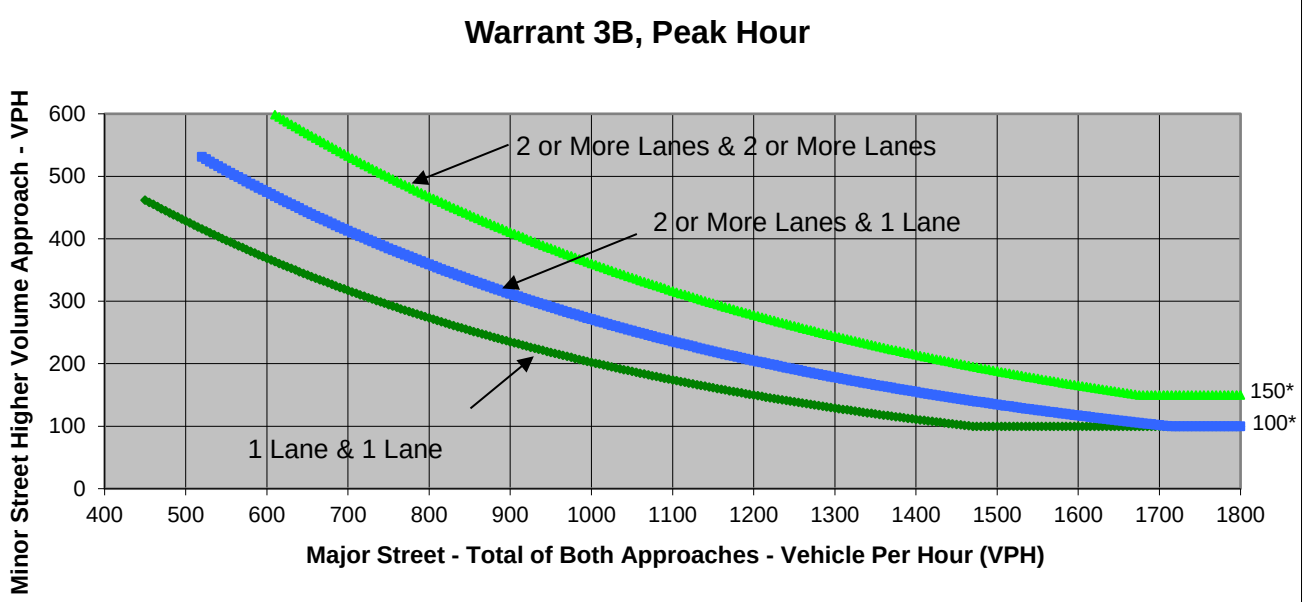
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 30 | 0 | 185 | 0 |
| Through | 0 | 0 | 721 | 1,083 |
| Right | 0 | 0 | 0 | 385 |
| Total | 30 | 0 | 906 | 1,468 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,374** | **30** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

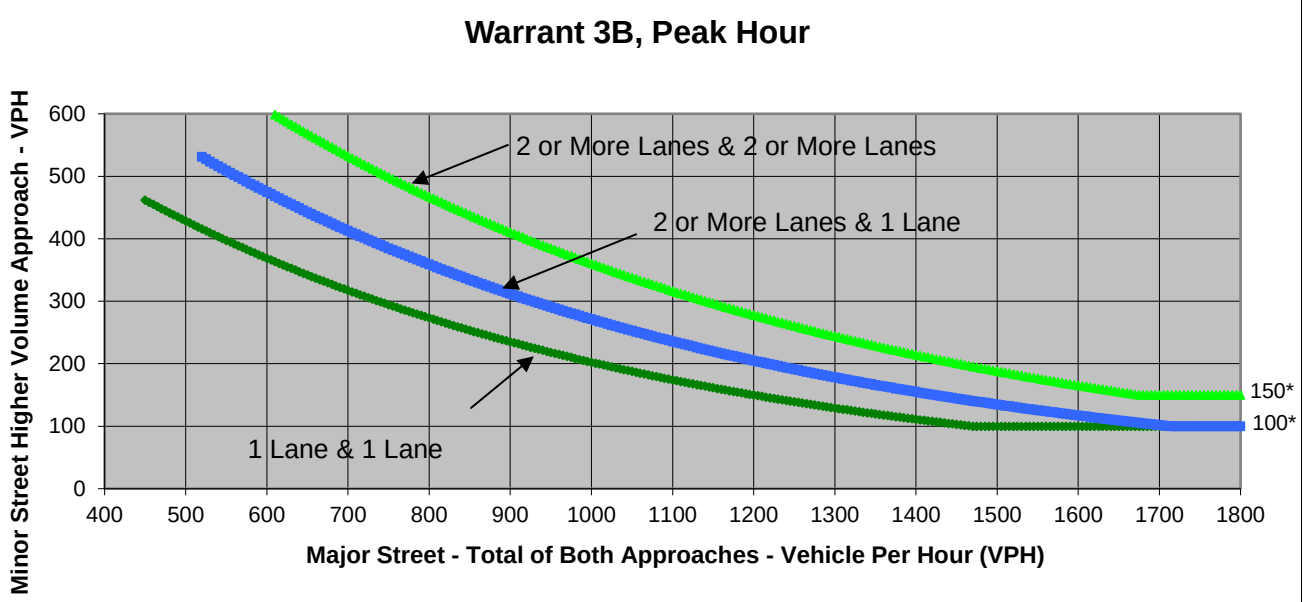
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 21 | 0 | 413 | 0 |
| Through | 0 | 0 | 744 | 782 |
| Right | 0 | 0 | 0 | 603 |
| Total | 21 | 0 | 1,157 | 1,385 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,542** | **21** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

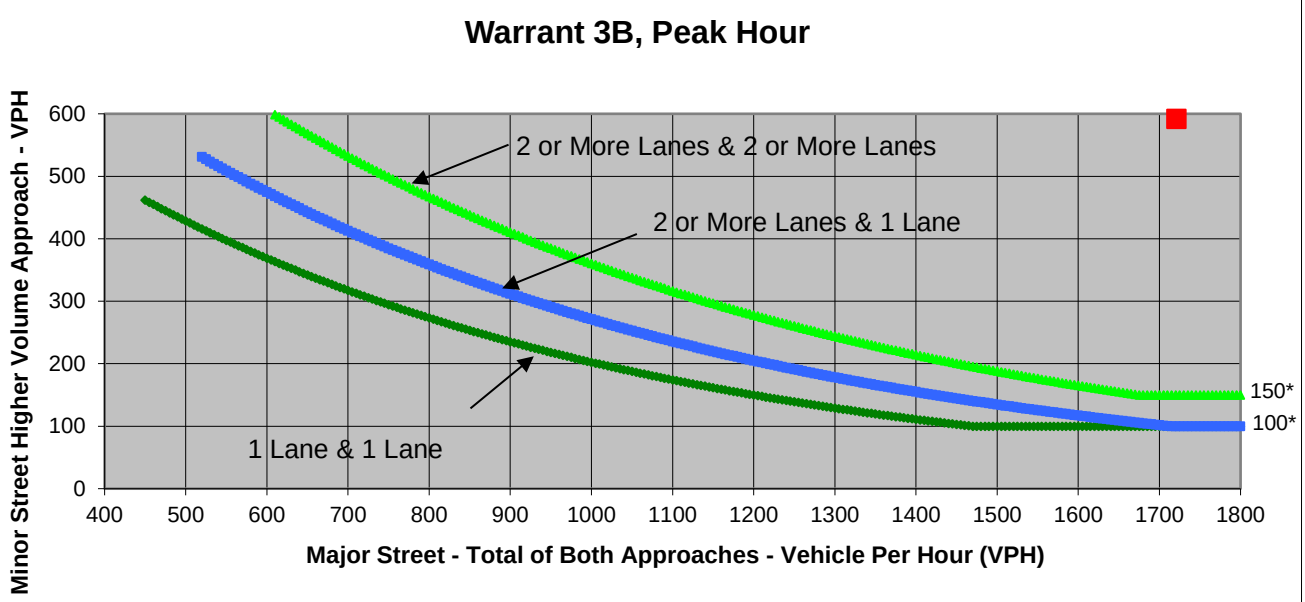
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 441 | 143 | 0 |
| Through | 0 | 0 | 465 | 450 |
| Right | 0 | 151 | 0 | 663 |
| Total | 0 | 592 | 608 | 1,113 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,721** | **592** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

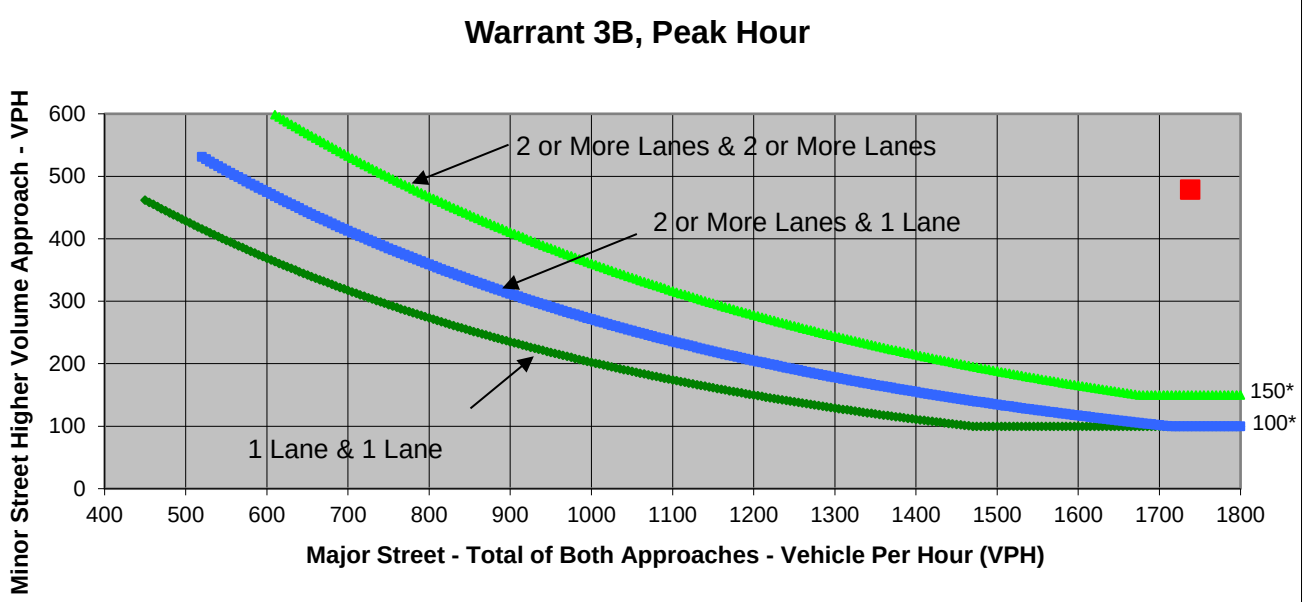
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 264 | 42 | 0 |
| Through | 0 | 0 | 893 | 271 |
| Right | 0 | 215 | 0 | 532 |
| Total | 0 | 479 | 935 | 803 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,738** | **479** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

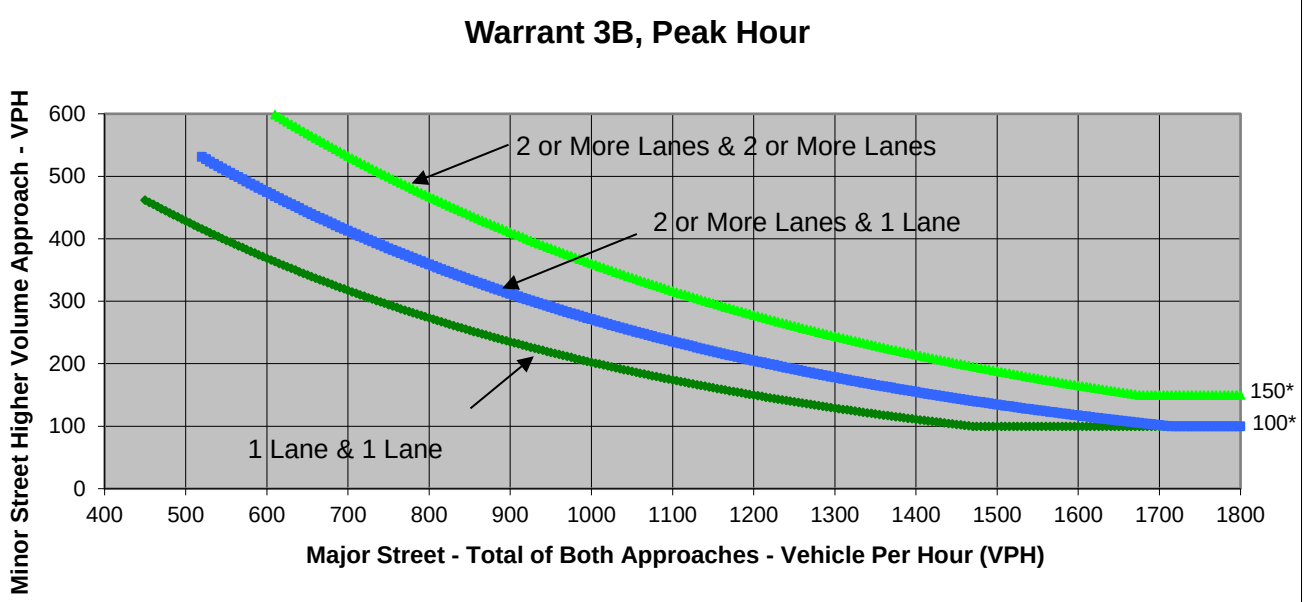
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 26 | 0 | 166 | 0 |
| Through | 0 | 0 | 729 | 1,100 |
| Right | 0 | 0 | 0 | 403 |
| Total | 26 | 0 | 895 | 1,503 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,398** | **26** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

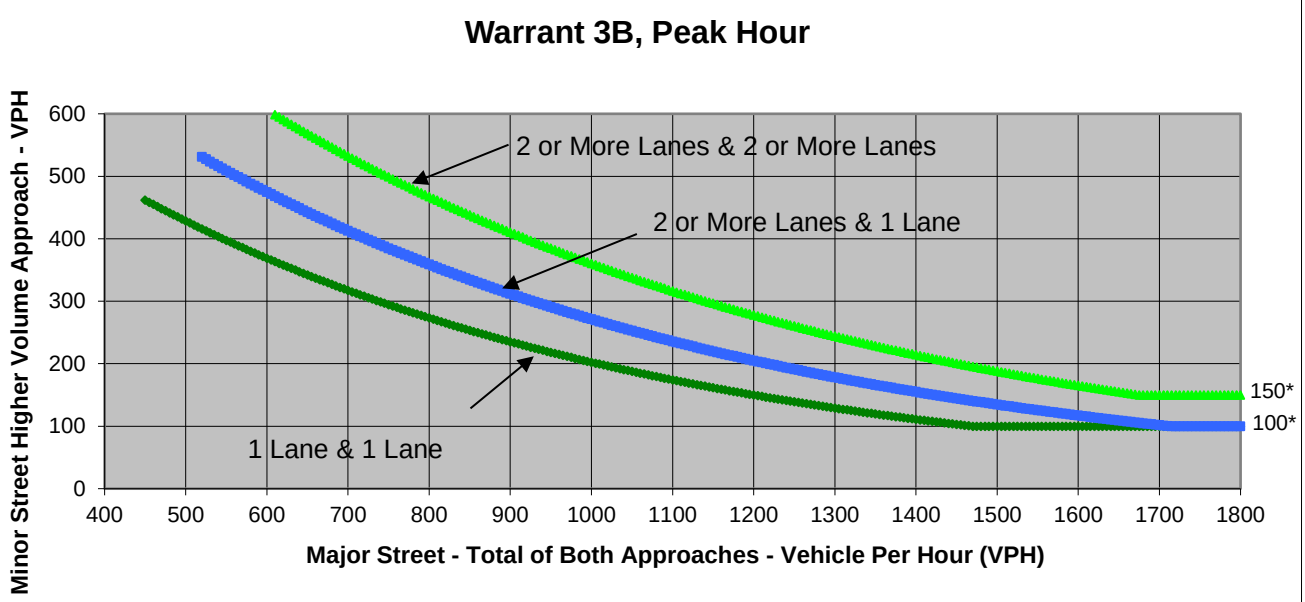
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 NB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 12 | 0 | 396 | 0 |
| Through | 0 | 0 | 754 | 792 |
| Right | 0 | 0 | 0 | 615 |
| Total | 12 | 0 | 1,150 | 1,407 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 NB Ramps | |
| **Number of Approach Lanes** | **1** | **1** | **NO** |
| **Traffic Volume (VPH) *** | **2,557** | **12** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

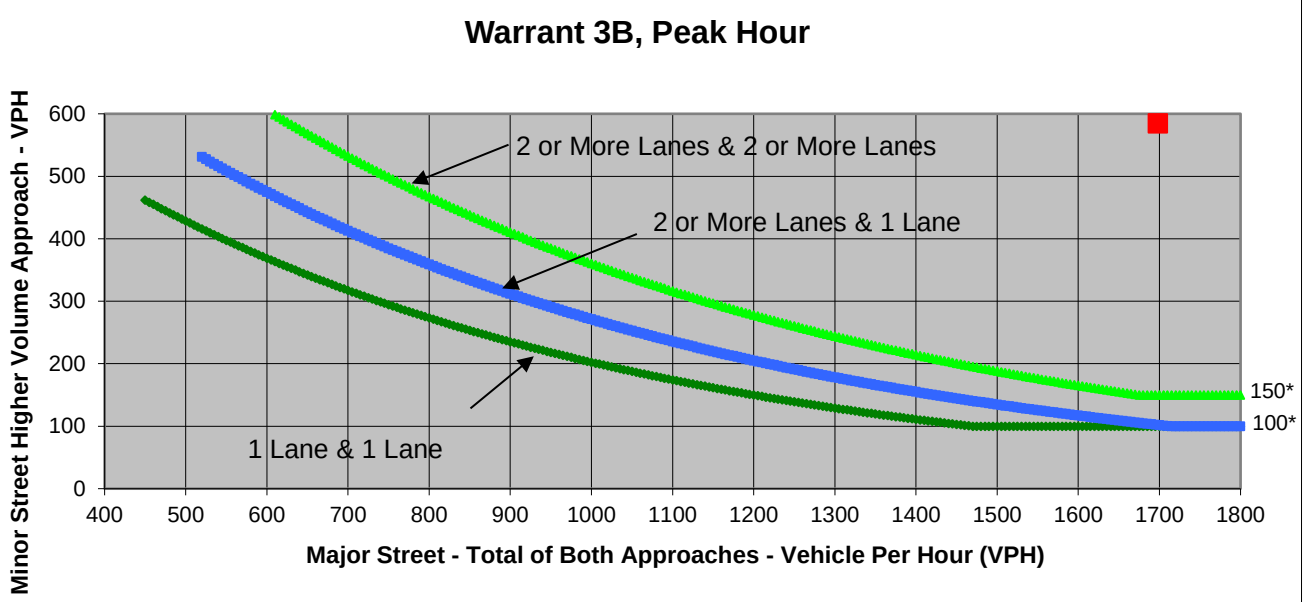
| | | | |
|---|---|---|---|
| Major Street | Sunol Boulevard | Project | Spotorno Ranch EIR |
| Minor Street | I-680 SB Ramps | Scenario | Cumulative Plus Project_No Bypass |
| | | Peak Hour | AM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 449 | 126 | 0 |
| Through | 0 | 0 | 446 | 447 |
| Right | 0 | 136 | 0 | 679 |
| Total | 0 | 585 | 572 | 1,126 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | **Major Street** | **Minor Street** | **Warrant Met** |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,698** | **585** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

FEHR PEERS

| | |
|---|---|
| Major Street | Sunol Boulevard |
| Minor Street | I-680 SB Ramps |

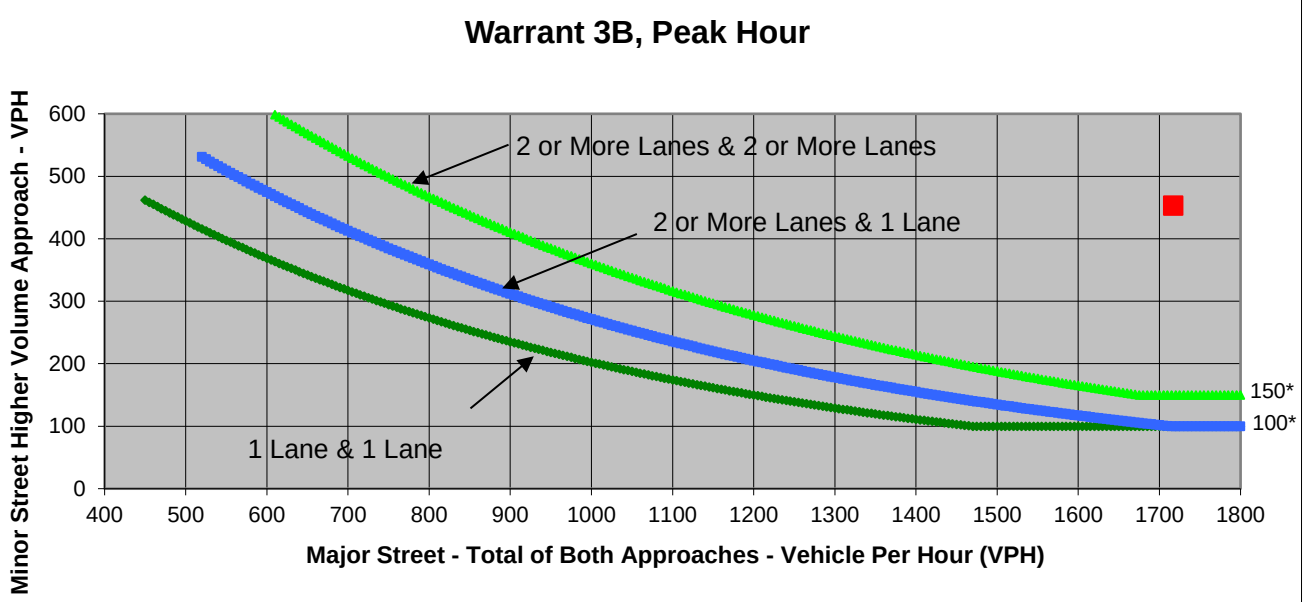
| | |
|---|---|
| Project | Spotorno Ranch EIR |
| Scenario | Cumulative Plus Project_No Bypass |
| Peak Hour | PM |

Turn Movement Volumes

| | NB | SB | EB | WB |
|---|---|---|---|---|
| Left | 0 | 273 | 36 | 0 |
| Through | 0 | 0 | 877 | 263 |
| Right | 0 | 180 | 0 | 541 |
| Total | 0 | 453 | 913 | 804 |

Major Street Direction

| | |
|---|---|
| | North/South |
| x | East/West |




* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

| | Major Street | Minor Street | Warrant Met |
|---|---|---|---|
| | Sunol Boulevard | I-680 SB Ramps | |
| **Number of Approach Lanes** | **1** | **2** | **YES** |
| **Traffic Volume (VPH) *** | **1,717** | **453** | |

* Note: Traffic Volume for Major Street is Total Volume of Both Approches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.

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# Appendix J:
# Happy Valley Specific Plan MMRP

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# APPENDIX J: LIST OF APPLICABLE MITIGATION MEASURES

## Introduction

This section lists the mitigation measures in the Happy Valley Specific Plan Mitigation and Monitoring Program (HVSP MMRP) pertinent to the Spotorno Ranch project.[1] This list is meant as a reference guide for the reader. The mitigation measures are listed by impact area. The measures listed below are hereby incorporated into the SEIR and will be carried forward as Conditions of Approval.

## Requirements of the Specific Plan Intended to Mitigate Potentially Adverse Environmental Impacts Applicable to the Spotorno Ranch Project

### A. Land Use

A1.[2] Land use standards, site development standards, and design guidelines apply to all development in the Specific Plan area.

*Timing: Land Use standards for each category, as well as some site development standards and design guidelines for some land use categories, area defined in the Specific Plan. Site development standards and design guidelines for the remaining land use categories are detailed below:*

**Table 1: Timing of Implementation for Site Development Standards, and Design Guidelines**

| Land Use | Site Development Standards | Design Guidelines |
|---|---|---|
| 1. PUD—Medium Density Residential District (Spotorno Upper Valley) **[This land use would be eliminated, and the site development standards and design guidelines would apply to the proposed project.]** | To be determined at the time of PUD development plan approval | To be determined at the time of PUD development plan approval |
| 2–3. PUD—Low Density Residential District (Spotorno Upper Valley and Golf Course Properties Housing) | Established in Specific Plan, except accessory structure height and yard setbacks to be determined at the time of PUD development plan approval. | To be determined at the time of PUD development plan approval |
| 4. PUD—Semi-Rural Density Residential District (Greater Happy Valley) **[This land use is not proposed as part of the Spotorno Ranch Project.]** | Established in Specific Plan | Established in Specific Plan |

[1] The HVSP MMRP was approved by the City of Pleasanton City Council Resolution No. 98-86.
[2] Some of the numbering is not sequential because not all of the mitigation measures apply to the project. The numbering shown matches the numbering in the HVSP MMRP.

**Table 1 (cont.): Timing of Implementation for Site Development Standards, and Design Guidelines**

| Land Use | Site Development Standards | Design Guidelines |
|---|---|---|
| 5. PUD—Golf Course [This subarea is not included in the Spotorno Ranch Project.] | Established in Specific Plan | Established in Specific Plan |
| 6. PUD—Open Space [This subarea is not included in the Spotorno Ranch Project.] | Established in Specific Plan | Established in Specific Plan |
| Source: Happy Valley Specific Plan MMRP, 1998. | | |

A2. Agricultural uses in areas within and adjacent to the Specific Plan area are protected from urban encroachment by making the future owners/tenants of land within the Plan Area aware of the nearby location and potential impacts of agricultural operations prior to moving to the area. Notification is to be achieved through inclusion in the recorded deed of sale of all subdivided parcels and in all property lease agreements within the Plan Area of a statement, signed by the future owner/tenant, describing the presence of nearby agricultural use and the potential nuisances associated with that use.

*Timing: Procedure to be required as a condition of subdivision map approval and building permit approval.*

A3. Before development of Golf Course housing or housing in the Spotorno Upper Valley LDR and MDR areas or the Spotorno Flat Area may occur, the City (which would own the Golf Course and open space lands) and developer(s) must prepare and approve a Wildland/Urban Interface Management Plan that contains (1) standards for the management of vegetation at the edge of the wildland or open space area near built areas and (2) standards for the design and construction of buildings adjacent to the wildland or open space areas.

*Timing: Prior to issuance of the first building permit on the affected properties.*

A4. Construction of the Golf Course, housing, road, infrastructure, and other site improvements is limited to the hours of 8:00 a.m. to 5:00 p.m., Monday through Sunday.

## B. Transportation

B5. Emergency vehicle access routes (EVAs) are to be added at the Golf Course, Laura Lane, Mockingbird Lane/East Mockingbird Lane, and Spotorno Flat Area.

*Timing: Golf Course EVA prior to opening of the Golf Course. Laura Lane EVA prior to occupancy of the first new home following subdivision of Lot 63. Mockingbird Lane/East Mockingbird Lane EVA to be determined through the City's Capital Improvement Program. Spotorno Flat EVA prior to occupancy of first new home following subdivision of Spotorno Flat area.*

## C. Noise

C4. Construction activity is limited to the hours of 8:00 a.m. to 5:00 p.m., Monday through Sunday. (Same as requirement A4).

*Timing: During construction.*

## D. Air Quality

D1. During the construction period, all active unpaved construction areas (residential, Golf Course, roads, and infrastructure) shall be watered as needed, or treated with soil stabilizers, in order to avoid dust, and exposed stockpiles of dirt or sand shall be enclosed, covered, or treated with dust-preventatives.

*Timing During grading and construction.*

D2. If soil material is carried over public or private roads, those roads shall be swept daily with water sweepers to control dust.

*Timing: During grading and construction.*

D3. In graded construction areas, replacement vegetation shall be planted as quickly as possible. Graded areas that remain inactive for ten days or more during the rainy season (October 1 to April 1) without permanent replanting should be hydroseeded or stabilized to inhibit dust. (Same as Requirement H6.)

*Timing: During grading and construction.*

D4. Excavation and grading shall be suspended when winds (instantaneous gusts) exceed 25 miles per hour.

*Timing: During grading and construction.*

## E. Water

E1. Water conservation devices and drought-tolerant landscaping shall be installed, and water reclamation measures shall be taken to the fullest extent feasible.

*Timing: Plan to demonstrate conformance prior to issuance of building permits.*

## F. Sanitary Sewer

F1. New sewer lines installed in the Happy Valley Specific Plan area must be of a material that minimizes or eliminates infiltration and inflow to those lines.

*Timing: Material selection prior to finalization of construction specification for the sewer system.*

## G. Drainage

G1. Design and construction of the project must comply with the Alameda Countywide Clean Water Program requirements for best management practices to control non-point source runoff pollutants.

*Timing: Prior to approval of grading plans for the Golf Course and all residential development projects in the Specific Plan area.*

G4. Along Alisal Street, cleaning of culverts and minor grading to improve existing drainage conditions, and replacement of private driveway culverts at the corrected grade at several locations along the street is required.

*Timing: At construction of the water and sewer systems; then on an as needed basis.*

G5. The developer of the Spotorno Flat area is required to replace crossroad drain lines with properly sized culverts, improve site drainage by constructing an earthen vee ditch with consistent fall (or other comparable improvement), and construct storm water detention facilities on the Spotorno Flat Area.

*Timing: Prior to acceptance of public improvement in the Spotorno Flat area.*

## H. Geology and Soils

H1. Individual development projects proposed within the Specific Plan Area shall be subject to preparation of a soils study as required by the Pleasanton General Plan (Public Safety Element. Policy 5). Design of such projects are required under the Plan, to incorporate all recommendations of the City's consulting engineer.

*Timing: Prior to issuance of building permits.*

H2. Purchasers of new residential units shall be provided with a copy of an earthquake hazards information document that describes the potential for strong groundbreaking at the site, potential effects of such groundbreaking, and earthquake preparedness procedures.

*Timing: Prior to (1) completion of sale or (2) occupancy (for non-owner-occupied buildings).*

H4. For areas with slopes steeper than 20 percent or within or adjacent to existing landslides, a slope stability analysis (addressing static and pseudo-static conditions) shall be prepared by a licensed Civil Engineer and include the appropriate recommendations from the approved geotechnical report for any proposed residential development or roadway construction. These geotechnical reports shall provide recommendations for control of surface drainage, adequate groundwater drainage, and slide mass removal or stabilization, if necessary. The analysis shall be supported by investigation of site-specific conditions that shall include but not be limited to:

- estimated recency of slope failures and potential for continued movement;
- depth of existing landslides or colluvial deposits and characterization of slide plane(s);

- shear strength data for subsurface materials at the project site;
- groundwater level data which characterizes seasonal fluctuations; and
- justification of seismic coefficient used in pseudo-static analysis.

Proposed cut and fill slope designs shall have factors of safety not lower than 1.5 under static conditions and 1.0 under seismic shaking conditions.[3]

*Timing: Prior to approval of grading plan.*

H5. Grading Plans and slope designs are subject to the following requirements:

- All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed geotechnical or civil engineer.
- To the extent possible, (1) grading plans shall minimize earthmoving and site grading in areas of potential land instability, and (2) the development design shall avoid placing structures, and utilities on or near the tops of slopes or in the shallow subsurface of slopes. Improvements proposed to be placed on slopes, or within ten feet of the tops of slopes, shall be approved for construction by a licensed Geotechnical Engineer or Certified Engineering Geologist.
- City shall approve grading plans and slope designs prior to implementation.
- All grading and slope preparation activities shall be conducted under the supervision of a licensed Geotechnical Engineer or Certified Engineering Geologist.

*Timing: Prior to approval of grading plan.*

H6. In graded construction areas, replacement vegetation shall be planted as quickly as possible. Graded areas that remain inactive for ten days or more during the rainy season (October 1 to April 1) without permanent replanting should be hydroseeded or stabilized to inhibit dust. (Same as Requirement D3.)

*Timing: During grading and construction*

H7. The final geotechnical report for the grading plan for proposed projects within the Specific Plan Area shall be prepared by a professional engineer and approved by the City of Pleasanton. The report shall address the potential for delayed consolidation within deep fills and associated land surface subsidence. The report shall provide specific recommendations for:

- Fill compaction specifications that consider the likelihood of eventual saturation and wetting and drying cycles for the fill materials;
- Removal of colluvial material or weathered rock that may be subject to consolidation under the load of proposed fills;

[3] Proposed cut and fill slope designs shall have factors of safety not lower than 1.5 under static conditions and 1.0 under seismic shaking conditions.

- Design that minimizes the variability of fill thickness within fills that underlie structures or other improvements at the project site; and
- Design and operation of adequate subsurface drainage systems for fills (particularly beneath heavily irrigated areas or other water sources such as swimming pools or detention basins). Drainage systems for the fills shall be designed to minimize maintenance and ensure long-term performance. Flow from the drainage system shall be controlled so as not to cause or contribute to erosion of existing drainage channels.

*Timing: Prior to approval of grading plans.*

H8. On expansive soils, building foundations and improvements shall consist of drilled pier and grade beams, deepened footings (extending below expansive soil), or post-tensioned slabs. Alternatively, expansive soil shall be removed and replaced with compacted non-expansive soil prior to foundation construction. The plan requires that subgrade soils for pavements consist of moisture-conditioned, lime-treated, or non-expansive soil, and that surface and subsurface water be directed away from foundation elements to minimize variations in soil moisture.

*Timing: Foundations and improvements to be specified in building plans prior to issuance of building permits.*

## I. Public Health and Safety

I1. Completion of a Phase I Environmental Site Assessment by a qualified environmental professional in accordance with the requirements of the American Society for Testing and Materials (ASTM, 1997) is required.

*Timing: Prior to approval of grading permits for the Golf Course and Spotorno properties.*

I6. Preparation of a Spill and Pollution Prevention Plan must be prepared by the contractor(s) for each development project with soil disturbance (e.g., grading) of at least five acres. The Plan must (1) be prepared prior to the start of earthwork activities, (2) designate an onsite employee responsible for Plan implementation, and (3) include anticipated equipment needs and maintenance, emergency response procedures for hazardous materials releases, and procedures for contacting designated regulatory agencies in the event of a hazardous materials release.

*Timing: Plan preparation prior to issuance of a grading permit; plan implementation during earthwork and construction activities.*

I7. Removal of aboveground or underground fuel tanks is required in accordance with the requirements of the Livermore-Pleasanton Fire Department, if these are to be removed as part of development under the Specific Plan.

*Timing: Prior to commencement of development activity on each applicable site.*

I10. Notification of the Underground Service Alert (USA) as well as site tenants is required prior to groundbreaking, to obtain information on the existing location of underground utilities.

*Timing: Prior to groundbreaking on each development site.*

I11. Contact with the Alameda County Mosquito Abatement District is required for assistance in con- trolling and managing potential disease-bearing vectors and their breeding areas (e.g., lakes, detention basins, springs), to reduce the potential for transmission of public health diseases associated with these organisms.

*Timing: Prior to issuance of a grading permit on each applicable site.*

## J. Biology

J1. A California Tiger Salamander Mitigation and Monitoring Plan must be prepared and submitted to the California Department of Fish and Game (DFG) for review and approval. Approval of the plan must be obtained from DFG.

*Timing: Prior to the issuance of any grading permits that affect tiger salamander habitat.*

J3. A preconstruction survey of the Spotorno residential development areas (Spotorno Flat and Upper Valley), Golf Course, and Golf Course Housing areas must be completed to verify the presence or absence of active raptor nests. If any active nests are found, construction must be scheduled so that it will not result in removal or abandonment of an active raptor nest.

*Timing: Prior to the start of construction activities.*

J4. If construction will affect Pond 3 (located in the hills east of the Spotorno Flat Area), a preconstruction survey of the pond must be completed to verify the presence or absence of active Tricolored blackbird nests.

*Timing: Prior to the start of construction activities.*

J6. DFG must be consulted regarding any areas subject to their jurisdiction prior to any encroachment into a designated corridor, and/or consultation with the Corps prior to any activity that would occur within the jurisdictional limits of wetlands or within the bed and bank of a waters of the U.S.

*Timing: Prior to the issuance of a grading permit in applicable areas.*

### EIR Mitigation Measure

J10. (EIR Mitigation Measure J1) Provide such additional mitigation of wetland impacts as may be required by the Army Corps of Engineers upon its review of applications for fill permits. The Corps may find the mitigations adequate, or may require additional measures preliminary to issuing fill permits.

*Timing: Prior to the issuance of grading permits for the applicable areas.*

## K. Cultural Resources

K2. If previously undiscovered historic or prehistoric resources are encountered during construction, work in the immediate area shall cease until such time that a qualified archaeologist has an opportunity to evaluate the find and make recommendations for mitigation, if warranted.

*Timing: During construction*

## L. Visual Resources

The following site development standards and design guidelines address the visual quality of development that is permitted by the Specific Plan:

**Table 2: Visual Resource Protections by Land Use Designation**

| Land Use | Specific Visual Resource Protections |
|---|---|
| 1. PUD—Medium Density Residential District (Spotorno Upper Valley) **[This land use would be eliminated, and the visual resource protections would not apply to the project.]** | Requires visual analysis to evaluate the potential impacts of development on the outlying community in northwest Pleasanton.<br>*Timing: In conjunction with determination of site development standards.* |
| 2–3. PUD—Low Density Residential District (Spotorno Upper Valley and Golf Course Properties Housing) | Site development standards in the Specific Plan establish protection or view corridors from the southern Alisal Street area.<br>Design guidelines require design of Golf Course homes to enhance the view of the Golf Course area from the Bypass Road. **[The Golf Course has already been constructed, and this visual resource protection would not apply to the proposed project].** |
| 4. PUD—Semi-Rural Density Residential District (Greater Happy Valley) | Site development standards in the Specific Plan establish protection for view corridors applicable to Lots 98, 99, and 100 and other lots near Lot 98.<br>Design guidelines include the objective of minimizing the visual prominence of homes; guidelines include requirements applicable to grading, architecture, and landscaping. |
| 5. PUD—Golf Course | Design guidelines specify that (1) grading which contrasts with the natural land forms of the area and (2) views of Golf Course road, parking lot, and service areas from the outlying Happy Valley area be minimized; that panoramic views from the Golf Course club- house be maintained; that accessory buildings and service areas be screened through grading and landscaping, and that lighting be subdued. **[The Golf Course has already been constructed, and this visual resource protection would not apply to the project].** |

**Table 2 (cont.): Visual Resource Protections by Land Use Designation**

| Land Use | Specific Visual Resource Protections |
|---|---|
| 6. PUD—Open Space | Design guidelines specify that new structures should be sited to minimize their visibility from the vicinity of the Happy Valley Loop roads and that grading for development of hilly areas should respect natural landforms. |

## M. Public Services

The Specific Plan includes a number of trails, which are described and mapped in the Plan and the EIR. No adverse impacts are identified, and no mitigation requirements are included in the Plan.

## N. Public Services: Police Services

No potential adverse impacts on police services were identified; therefore, no mitigation requirements for potential impacts on police service were included in the Specific Plan.

## O. Public Services: Fire Protection

O1. To protect new development from fire hazards, all residential structures located beyond the five-minute response time from the nearest fire station as well as the Golf Course clubhouse must be equipped with automatic fire sprinklers and Class A fire-retardant roofing, and new homes within the five-minute response time area are to be protected with at least Class B roofing.

*Timing: Inclusion of sprinklers and designation of roofing materials to be confirmed prior to issuance of building permits and during construction inspections.*

## All Mitigation Measures Contained in the HVSP MMRP

The following table lists all the mitigation measures in the Mitigation Monitoring Program for the Happy Valley Specific Plan. In addition, this table describes why some mitigation measures would not apply to the Spotorno Ranch Project and are not included in the section above.

**Table 3: All Mitigation Measures Contained in the HVSP MMRP**

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| Land Use | A1. See Table 1 | Applicable to the proposed project. |
| | A2. Agricultural uses in areas within and adjacent to the Specific Plan area are protected from urban encroachment by making the future owners/tenants of land within the Plan Area aware of the nearby location and potential impacts of agricultural operations prior to moving to the area. Notification is to be achieved through inclusion in the recorded deed of sale of all subdivided parcels and in all property lease agreements within the Plan Area of a statement, signed by the future owner/tenant, describing the presence of a nearby agricultural use and the potential nuisances associated with that use. (The precise language of the statement is included in the Specific Plan.)<br>*Timing: Procedure to be required as a condition of subdivision map approval and building permit approval.* | Applicable to the proposed project. |
| | A3. Before development of Golf Course housing or housing in the Spotorno Upper Valley LDR and MDR areas or the Spotorno Flat Area may occur, the City (which would own the Golf Course and open space lands) and developer(s) must prepare and approve a Wildland/Urban Interface Management Plan that contains ( l ) standards for the management of vegetation at the edge of the wild- land or open space area near built areas and (2) standards for the design and construction of buildings adjacent to the wildland or open space areas.<br>*Timing: Prior to issuance of the first building permit on the affected properties.* | Applicable to the proposed project. |
| | A4. Construction of the Golf Course, housing, road, infrastructure, and other site improvements is limited to the hours of 8:00 AM to 5:00 PM, Monday through Saturday.<br>*Timing: During construction.* | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| Transportation | B1. A Bypass Road that provides access to the eastern and southern portions of the site is to be constructed. This road would supplement current access, which is limited to the Happy Valley Loop.<br>*Timing: Earth construction of the Bypass Road is a high priority and should be completed prior to the opening of the Golf Course assuming that the East-West Collector Road through the North Sycamore Specific Plan area is completed at least one year earlier.* | This mitigation measure is not applicable to the Spotorno Ranch Project because the Bypass Road would not be constructed as part of the project. |
| | B2. The curvature of Happy Valley Road at Lot 57 is to be increased.<br>*Timing: In conjunction with first pavement overlay following installation of water and/or sewer lines (whichever comes first).* | This mitigation measure is not applicable to the Spotorno Ranch Project because Lot 57 is not included in the project. |
| | B3. A YIELD-sign for westbound traffic is to be placed at the existing railroad trestle undercrossing located on Happy Valley Road west of the Plan Area. This improvement would be located outside the City of Pleasanton, and requires cooperation with Alameda County.<br>*Timing: Upon annexation of the Plan Area to the City of Pleasanton.* | This mitigation measure is not applicable because the Plan Area has already been annexed to the City of Pleasanton. |
| | B4. The inside shoulder of Alisal Street and Happy Valley Road is to be widened.<br>*Timing: In conjunction with first pavement overlay following installation of water and/or sewer lines (whichever comes first) for each street.* | This mitigation measures is not applicable because the shoulders of Alisal Street and Happy Valley Road were widened in conjunction with the first pavement overlay. |
| | B5. Emergency vehicle access routes (EVAs) are to be added at the Golf Course, Laura Lane, Mockingbird Lane/East Mockingbird Lane and Spotorno Flat area.<br>*Timing: Golf Course EVA prior to opening of the Golf Course. Laura Lane EVA prior to occupancy of the first new home following subdivision of Lot 63. Mockingbird Lane/East Mockingbird Lane EVA to be determined through the City's Capital Improvement Program. Spotorno Flat EVA prior to occupancy of first new home following subdivision of the Spotorno Flat area.* | Applicable to the proposed project. |
| | B6. Construction vehicles en route to development sites on the Spotorno Property, including both the Spotorno Upper Valley Area and the Spotorno Flat Area, may use | This mitigation measure is not applicable because the Bypass Road would not be |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | only the Bypass Road. A series of specified alternative routes, appropriate to different conditions, for construction vehicles en route to the Golf Course and Golf Course Housing areas, are also specified in the Plan.<br>*Timing: During construction* | constructed as part of the project. Construction vehicles would access the site via Alisal Street and Westbridge Lane. |
| Noise | C1. Any pump station in the Happy Valley must be situated and designed so that pump noise level will not exceed 50 dBA at the property line or boundary of the easement of the pump site.<br>*Timing: When water and sewer systems are designed and built.* | This mitigation measure is not applicable to the proposed project because no pump stations are proposed. |
| | C2. The use of gasoline-powered golf carts is prohibited.<br>*Timing: During Golf Course operations* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | C3. If the Golf Course clubhouse has a public address system (e.g., for calling golf parties to the first tee), then the system must have volume control and must be operated at a volume that is not audible at the nearest residence.<br>*Timing: During Golf Course operations.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | C4. Construction activity is limited to the hours of 8:00 AM to 5:00 PM, Monday through Saturday. (Same as Requirement A4.)<br>*Timing: During construction.* | Applicable to the proposed project. |
| Air Quality | D1. During the construction period, all active unpaved construction areas (residential, Golf Course, roads, and infrastructure) shall be watered as needed, or treated with soil stabilizers, in order to avoid dust, and exposed stockpiles of dirt or sand shall be enclosed, covered, or treated with dust-preventives.<br>*Timing: During grading and construction.* | Applicable to the proposed project. |
| | D2. If soil material is carried over public or private roads those roads shall be swept daily with water sweepers to control dust.<br>*Timing: During grading and construction.* | Applicable to the proposed project. |
| | D3. In graded construction areas, replacement vegetation shall be planted as quickly as possible. Graded areas that remain inactive for ten days or more during the rainy season (October 1 to April 1) without permanent | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | replanting should be hydroseeded or stabilized to inhibit dust. (Same as Requirement H6.)<br><br>*Timing: During grading and construction* | |
| | D4. Excavation and grading shall be suspended when winds (instantaneous gusts) exceed 25 miles per hour.<br><br>*Timing: During grading and construction.* | Applicable to the proposed project. |
| Water | E1. Water conservation devices and drought-tolerant landscaping shall be installed, and water reclamation measures shall be taken to the fullest extent feasible.<br><br>*Timing: Plans to demonstrate conformance prior to issuance of building permits.* | Applicable to the proposed project. |
| | E2. The Golf Course shall be designed so as to minimize potable water use; e.g., by specifying the use of turf species and other materials that are relatively less demanding of water.<br><br>*Timing: Plans to demonstrate conformance prior to issuance of building permits.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | E3. Plant materials that can tolerate the total dissolved solids (IDS) and other water quality characteristics of recycled water that could become available to the project should be chosen for the non-tees and -greens areas of the Golf Course. Tees and greens, which require better-quality (less salty) water, should use potable water to maintain plant health and attractiveness. (Use of recycled water blended with groundwater may be an acceptable alternative to potable water for tees and greens.)<br><br>*Timing: Prior to approval of the landscape plan for the Golf Course.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | E4. When technically and economically feasible, recycled water should be used for irrigation of the Golf Course (except the tees and greens) and other public spaces, in accordance with Regional Board Order No. 93-159, if consistent with the recommendations that emerge from the salt management plan. The irrigation transmission pipeline and irrigation system should be constructed completely separate from the potable water system, and these facilities should be marked to make the non-potable nature of the system obvious.<br><br>*Timing: When technically and economically feasible* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | E5.[1] A Golf Course Management Plan is required for the protection of water quality (See Requirement G9). This | This mitigation measure is not applicable to the |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | plan includes standards for the use and storage of fertilizers, herbicides, and other chemicals.<br>*Timing: Prior to issuance of a grading permit for the Golf Course.* | proposed project because it is not located in the Golf Course Subarea. |
| | E6.[1] Site selection, grading, landscape screening, and other suitable treatment to minimize the visibility of water tanks and pump stations are governed by site development standards incorporated in the Specific Plan.<br>*Timing: Confirm that standards are met prior to finalization of construction specifications for the water and sewer systems.* | This mitigation measure is not applicable to the proposed project because no new water tanks or pump stations are proposed. |
| Sanitary Sewer | F1. New sewer lines installed in the Happy Valley Specific Plan area must be of a material that minimizes or eliminates infiltration and inflow to those lines.<br>*Timing: Material selection prior to finalization of construction specifications for the sewer system.* | Applicable to the proposed project. |
| Drainage | G1. Design and construction of the project must comply with the Alameda Countywide Clean Water Program requirements for best management practices to control non-point source runoff pollutants.<br>*Timing: Prior to approval of grading plans for the Golf Course and all residential development projects in the Specific Plan area.* | Applicable to the proposed project. |
| | G2. Design of the Golf Course must include storm water detention facilities that will help reduce peak flows to Happy Valley Creek, and will thus reduce both the frequency and severity of downstream flooding.<br>*Timing: Prior to approval of the Golf Course grading plan.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |
| | G3. Along Happy Valley Road, grading of earthen vee ditches at existing cross drains, cleaning of existing drainage ditches, and replacement of driveway culverts as necessary to maintain positive fall at all of the vee ditches is required.<br>*Timing: At construction of the water and sewer systems; then on an as-needed basis.* | This mitigation measure is not applicable to the proposed project because Happy Valley Road is not part of the project site. |
| | G4. Along Alisal Street, cleaning of culverts and minor grading to improve existing drainage conditions, and replacement of private driveway culverts at the corrected grade at several locations along the street is required.<br>*Timing: At construction of the water and sewer systems; then on an as-needed basis.* | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | G5. The developer of the Spotorno Flat area is required to replace crossroad drain lines with properly- sized culverts, improve site drainage by constructing an earthen vee ditch with consistent fall (or other comparable improvement), and construct storm water detention facilities on the Spotorno Flat Area.<br><br>*Timing: Prior to acceptance of public improvements in the Spotorno Flat area.* | Applicable to the proposed project. |
| | G6. In the Spotorno Upper Valley Medium Density Residential area, construction of storm water detention facilities to reduce increases in runoff into Sycamore Creek is required.<br><br>*Timing: Prior to occupancy of new homes in the Spotorno Upper Valley Medium Density Residential area.* | This mitigation would not be applicable to the proposed project because the project would not develop housing on the Spotorno Upper Valley Medium Density Residential Area. |
| | G7. Evaluation of the existing Spotorno Dam by a qualified professional engineer is required. This evaluation would address safety and stability. If any needed upgrades are identified as a result of this evaluation, they would be completed prior to completion of the Bypass Road.<br><br>*Timing: Evaluation prior to finalization of construction specifications for the Bypass Road; upgrades, if necessary, prior to completion of the Bypass Road.* | This mitigation would not be applicable to the proposed project because the existing Spotorno Dam is located just within the northeastern boundary of the project site in an area that would remain open space. |
| | G8. The Golf Course improvements include construction of a maintenance facility for servicing of equipment required for Golf Course operations (such as mowers and aerators) and golf carts. The maintenance of this equipment would be conducted within a building or under a roofed and paved area to isolate spills or residues of maintenance-related pollutants from storm water runoff. The maintenance area would also be the site of hazardous materials (e.g., lubricants, coolant, and cleaners) storage and an aboveground fuel tank. The maintenance area would be operated under a Storm Water Pollution Prevention Plan that would include implementation of structural e.g., drain- age inlets with oil/water separators or filters, secondary containment for hazardous spills) and non-structural (e.g., "good housekeeping" policies, dry cleanup of spills) Best Management Practices (BMPs).<br><br>*Timing: Prior to approval of a final design for the Golf Course.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | G9. A Golf Course Design and Management Plan shall be developed that, when properly implemented, would reduce or eliminate impacts to surface water quality from Golf Course operation and maintenance. This plan would, at a minimum:<br>• *Minimize Golf Course runoff into nearby creeks.* The plan would require (1) a minimum ten- foot natural vegetated buffer between the edge of irrigated turf grass and the top of bank of sensitive drainages and (2) drainage of all maintained turf areas away from nearby creeks and toward facilities planned to accommodate and manage runoff. These runoff management facilities include the new lake(s) planned for the Golf Course and grassed swales, area drains, and/or sumps for percolation.<br>• Flow of Golf Course drainage away from creeks and drainage channels must be shown on grading and drainage plans.<br>• Areas of maintained turf grass that drain towards creeks and drainage channels shall be minimized, and any such areas shall be indicated in the grading and drainage plans. Those areas shall be planted in either low maintenance turf grasses or naturalized or native grasses; alternatively, the areas shall be separated from the creeks or drainage channels by vegetated natural buffer areas.<br>• Areas of high maintenance such as tees, fairways, and greens will be required to drain away from sensitive drainages.<br>• Areas between golf holes shall generally be left in naturalized grasses to catch and obstruct run- off. Where this is not possible, in particular where there are long continuous slopes, areas between golf holes shall be graded to minimize high velocity flows.<br>• Manage discharge from subdrains. The Golf Course will be designed so that drain pipe dis- charge points from subdrains of greens or tees drain into vegetated swales or irrigation storage lakes. The subdrain discharge points may not be within 100 feet of a drainage channel. Dis- charge pipes must be directed to dense turf grass areas that can act as a biotic filter and allow percolation. The location of all drainages shall be indicated on the grading and drainage plans.<br>• In most cases, it should be possible to provide a minimum of 100 lineal feet of grassy swale treatment (a sinuous swale, if necessary to increase length) prior to discharge to creeks. Grading and drainage systems shall be designed so that discharge | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | occurs on the far side of the green or tee from the creek and, therefore, must travel in a grassy swale or thatch layer back around the tee or green to reach the creek. If subdrain discharge points must be within 100 feet of sensitive drainages to accommodate overall Golf Course design, alternative Best Management Practices (BMPs) shall be implemented to provide an equivalent level of runoff treatment. BMPs that may offer an equivalent level of treatment relative to 100 feet of overland or swale flow through turfgrass include infiltration (vaults or trenches) and media filtration (sand or sand/peat mixtures) features.<br>• Minimize the use of high maintenance turf grass. The Golf Course Design and Management Plan shall reduce the amount of high maintenance turf grasses where possible. Turf grasses that require less fertilization, such as fescues and ryegrass, shall be used for larger areas of turf grass. Out-of-play areas shall use native plants where possible.<br>• An efficient irrigation system shall be used, including a means of matching watering requirements with the evapotranspiration rate of the plants. Runoff shall be recycled back into the irrigation system though use of irrigation storage lakes as collectors, wherever possible. These requirements shall be indicated on the irrigation plans.<br>• *Minimize erosion by stabilizing creek channels.* The plan requires that newly-constructed (relocated) creek channels be designed and constructed to be stable. In addition, unstable portions of existing channel shall be stabilized to prevent further channel incision. The design should avoid abrupt changes in channel gradient and creek channel restrictions to flow (e.g., abutments for in-channel golf cart bridges). The designers shall consider use of coarse rock fragments (such as cobbles and boulders) and vegetation within drainage swales and creeks to limit flow velocities and erosion of the channel bed, stabilize the channel banks, improve the aesthetic appearance, and provide for some runoff filtration/treatment. Rock and vegetation in creeks would also discourage golf play within the channel, minimizing potential water quality impacts caused by users of the Golf Course.<br>• Transitions from graded areas to existing unmodified creek channels shall be carefully designed to avoid creation of nickpoints and abrupt changes in channel conditions that could lead to instability. Steepened channel reaches shall where necessary, include | |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | channel grade controls. Energy dissipation structures shall be included in the design of the outlets of culverted sections of the creek to avoid erosion of creek channels. Golf cart creek crossings shall be designed to eliminate potential erosion impacts associated with golf carts in creeks. Either bridges or paved surfaces shall be provided at each crossing. Obstructions (e.g., appropriate vegetation and rocks) shall be placed along the creek at each crossing to discourage "off-path" travel through the creek channels.<br><br>*Timing: Prior to approval of a final design for the Golf Course.* | |
| | G10. An Integrated Pest Management Plan (IPM) shall be prepared by a qualified agronomist or turf grass specialist. The IPM shall by guided by the principles of (1) minimizing the use of pesticides on the Golf Course, (2) using pesticides only in response to a persistent pest problem, (3) prohibiting preventative chemical use, and (4) fully integrating cultural and biological approaches to pest control into the IPM, with an emphasis toward reducing pesticide application. Consistent with these principles, the IPM will:<br>• Address and recommend methods of pest prevention and turf grass management that use pesticides as a last resort in pest control.<br>• Specify types and rates of fertilizer and pesticide application. Special attention in the IPM shall be directed toward avoiding runoff of pesticides and nitrates into sensitive drainages or leaching into the shallow groundwater table.<br>• Detail how fertilization requirements are to be reduced during turf grass grow-in. Fertilizer requirements for turf grass germination and maturation can be lowered by ensuring topsoil is maintained or replaced during grading operations to sustain the organic quality of the native soil. Organic amendments such as sludge, manure, fir bark, or peat greatly increase the organic quality of the soil and greatly reduce fertilizer needs. These organic amendments also increase percolation rates and act as stronger binder for the adsorption of fertilizer and pesticide com- pounds. Soil tests shall be performed prior to seeding to determine the proper fertilization rates pre- and post-seeding.<br><br>*Timing: Prior to approval of a final landscape plan for the Golf Course* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | G11. A Water Quality Monitoring Plan shall be prepared and implemented to evaluate the effectiveness of the Storm Water Pollution Prevention Plan (SWPPP; see the discussion of NPDES requirements on p. 89 of the DEIR) and Golf Course Design and Management Plan (See Requirement 09, above) at protecting surface and groundwater quality in the vicinity of the site. The Water Quality Monitoring Plan shall include the following:<br>• *Identification of sampling locations.* The plan shall establish fixed surface and groundwater sampling locations. Surface water samples shall be collected from detention basin outlets during the first significant storm event of the rainy season each year ("first flush"). In addition, surface water samples shall be collected from creeks that drain the proposed Golf Course. Groundwater samples shall be collected from shallow monitoring wells installed in areas of high groundwater conditions, particularly in alluvial sediments along the seasonal creeks and near detention basins.<br>• Establishment of sampling parameters, protocols, and frequency. The plan shall establish the compounds to be analyzed based on the uses of the site. For example, samples collected from areas which drain the Golf Course shall be analyzed for the specific pesticide and herbicide compounds used on the course. The plan shall also establish the required sampling protocols and frequency for each sampling event so that consistent high quality data can be compiled.<br>• Establishment of criteria for data analysis and review. The plan shall establish criteria for evaluating the data (e.g., regulatory threshold values for pollutants). Once collected, the data shall be analyzed by a qualified professional and compared to the established criteria to evaluate potential impacts. If water quality degradation is identified, the qualified professional shall recommend actions to mitigate the impact. Reports summarizing the analytical data and conclusions shall be submitted to the City of Pleasanton for review and approval on an annual basis.<br>*Timing: Prior to issuance of grading permits.* | This mitigation measure is not applicable to the proposed project because it is not located in the Golf Course Subarea. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| Geology and Soils | H1. Individual development projects proposed within the Specific Plan Area shall be subject to preparation of a soils study as required by the Pleasanton General Plan (Public Safety Element. Policy 5). Design of such projects are required under the Plan, to incorporate all recommendations of the City's consulting engineer.<br><br>*Timing: Prior to issuance of building permits.* | Applicable to the proposed project. |
| | H2. Purchasers of new residential units shall be provided with a copy of an earthquake hazards information document that describes the potential for strong groundshaking at the site, potential effects of such groundshaking, and earthquake preparedness procedures.<br><br>*Timing: Prior to (1) completion of sale or (2) occupancy (for non-owner-occupied buildings).* | Applicable to the proposed project. |
| | H3. The developer shall prepare an earthquake preparedness and emergency response plan for each community use facility, including the proposed Golf Course clubhouse.<br><br>*Timing: Prior to occupancy of new development permitted by the Specific Plan.* | This mitigation measure is not applicable because a community use facility is not proposed as part of the project. |
| | H4. For areas with slopes steeper than 20 percent or within or adjacent to existing landslides, a slope stability analysis (addressing static and pseudo-static conditions) shall be prepared by a licensed Civil Engineer and include the appropriate recommendations from the approved geotechnical report for any proposed residential development or roadway construction. These geotechnical reports shall provide recommendations for control of surface drainage, adequate groundwater drainage, and slide mass removal or stabilization, if necessary. The analysis shall be supported by investigation of site-specific conditions that shall include but not be limited to:<br>• estimated recency of slope failures and potential for continued movement;<br>• depth of existing landslides or colluvial deposits and characterization of slide plane(s);<br>• shear strength data for subsurface materials at the project site;<br>• groundwater level data which characterizes seasonal fluctuations; and<br>• justification of seismic coefficient used in pseudo-static analysis.<br><br>Proposed cut and fill slope designs shall have factors of | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | safety not lower than 1.5 under static conditions and 1.0 under seismic shaking conditions.<br><br>*Timing: Prior to approval of grading plan.* | |
| | H5. Grading plans and slope designs are subject to the following requirements:<br>• All grading plans, cut and fill slopes, compaction procedures, and retaining structures shall be designed by a licensed geotechnical or civil engineer.<br>• To the extent possible, (1) grading plans shall minimize earthmoving and site grading in areas of potential land instability, and (2) the development design shall avoid placing structures, and utilities on or near the tops of slopes or in the shallow subsurface of slopes. Improvements proposed to be placed on slopes, or within ten feet of the tops of slopes, shall be approved for construction by a licensed Geotechnical Engineer or Certified Engineering Geologist.<br>• City shall approve grading plans and slope designs prior to implementation.<br>• All grading and slope preparation activities shall be conducted under the supervision of a licensed Geotechnical Engineer or Certified Engineering Geologist.<br><br>*Timing: Prior to approval of grading plan.* | Applicable to the proposed project. |
| | H6. In graded construction areas, replacement vegetation shall be planted as quickly as possible. Graded areas that remain inactive for ten days or more during the rainy season (October 1 to April 1) without permanent replanting should be hydroseeded or stabilized to inhibit dust. (Same as Requirement D3.)<br><br>*Timing: During grading and construction.* | Applicable to the proposed project. |
| | H7. The final geotechnical report for the grading plan for proposed projects within the Specific Plan Area shall be prepared by a professional engineer and approved by the City of Pleasanton. The report shall address the potential for delayed consolidation within deep fills and associated land sur- face subsidence. The report shall provide specific recommendations for:<br>• Fill compaction specifications that consider the likelihood of eventual saturation and wetting and drying cycles for the fill materials:<br>• Removal of colluvial material or weathered rock that may be subject to consolidation under the load of proposed fills; | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | • Design that minimizes the variability of fill thickness within fills that underlie structures or other improvements at the project site; and<br>• Design and operation of adequate subsurface drainage systems for fills (particularly beneath heavily irrigated areas or other water sources such as swimming pools or detention basins). Drainage systems for the fills shall be designed to minimize maintenance and ensure long-term performance. Flow from the drainage system shall be controlled so as not to cause or contribute to erosion of existing drainage channels.<br>*Timing: Prior to approval of grading plans.* | |
| | H8. On expansive soils, building foundations and improvements shall consist of drilled pier and grade beams, deepened footings (extending below expansive soil), or post-tensioned slabs. Alternatively, expansive soil shall be removed and replaced with compacted non-expansive soil prior to foundation construction. The plan requires that subgrade soils for pavements consist of moisture- conditioned, lime-treated, or non-expansive soil, and that surface and subsurface water be directed away from foundation elements to minimize variations in soil moisture.<br>*Timing: Foundations and improvements to be specified in building plans prior to issuance of building permits.* | Applicable to the proposed project. |
| Public Health and Safety | I1. Completion of a Phase I Environmental Site Assessment by a qualified environmental professional in accordance with the requirements of the American Society for Testing and Materials (ASTM, 1997) is required.<br>*Timing: Prior to approval of grading permits for the Golf Course and Spotorno properties.* | Applicable to the proposed project. |
| | I2. Completion of a Phase II Environmental Site Assessment is required if the findings of the Phase I Environmental Site Assessment indicate the presence of, or potential for, use of hazardous materials in association with current or historical land uses. The Phase II Assessment, to ascertain whether past or current land uses have contributed to soil and groundwater contamination at the site, must be conducted by a qualified environmental professional. Soil and groundwater samples collected during the Phase II Assessment shall be submitted to a California-certified laboratory for analysis.<br>*Timing: Prior to approval of grading permits for the Golf Course and Spotorno properties.* | This mitigation measure is not applicable to the proposed project because the Phase I did not require a Phase II. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | I3. Evaluation of the analytical results of the Phase II Assessment by a qualified environmental professional is required to determine whether chemicals could pose a hazard to future site users, construction workers, or the environment. If chemicals at the site could pose a hazard, a qualified professional shall conduct a risk assessment to quantify hazards based on soil and/or groundwater sampling results, and develop appropriate remediation measures, as necessary, to reduce potential risks for future site users to acceptable levels. Potential remediation measures may include, but not be limited to, soil removal. capping with an impermeable cover, soil vapor extraction, and groundwater remediation and/or monitoring. Regulatory agency oversight shall be obtained, as appropriate, from a local or State agency.<br>*Timing: Prior to approval of grading permits for the Golf Course and Spotorno properties.* | This mitigation measure is not applicable to the proposed project because the Phase I did not require a Phase II. |
| | I4. Completion of an inventory of the interior areas of all on-site agricultural structures is required. If hazardous materials are identified as being stored in these areas at that time, those materials shall be transported to and disposed of/recycled at an appropriate off-site facility.<br>*Timing: Prior to issuance of demolition permits for agricultural structures.* | This mitigation measure is not applicable to the proposed project because no agricultural structures would be demolished as part of the project. |
| | I5. Monitoring by an environmental professional during the removal of the floors/foundations is required to determine if hazardous materials spills are present or suspected to have occurred in interior areas of on-site agricultural structures (pursuant to Requirement 14). After demolition, a report by the environmental professional shall be submitted to the City delineating whether hazardous materials appeared to be present below the floors or foundations. If evidence of hazardous materials is found a soil sampling plan shall be prepared and implemented prior to disturbance of native soils. The soil samples shall be collected by a qualified environmental professional and submitted to a California-certified laboratory for analysis. The analytical results shall be evaluated by a qualified environmental professional for development of an appropriate health and safety plan for construction workers involved in site demolition activities, waste disposal options, and potential site investigation/remediation. | This mitigation measure is not applicable to the proposed project because no removal of floors or foundations would occur. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | *Timing: (1) Monitoring for presence of hazardous materials: during removal of floors/foundations. (2) Report to City of whether hazardous materials were found: after structure demolition. (3) Approval of a Soil Sampling Plan (if necessary): prior to disturbance of native soils. (4) Approval of a health and safety plan (if necessary): prior to new site preparation and construction* | |
| | I6. Preparation of a Spill and Pollution Prevention Plan must be prepared by the contractor(s) for each development project with soil disturbance (e.g., grading) of at least five acres. The Plan must (1) be prepared prior to the start of earthwork activities, (2) designate an onsite employee responsible for Plan implementation, and (3) include anticipated equipment needs and maintenance, emergency response procedures for hazardous materials releases, and procedures for contacting designated regulatory agencies in the event of a hazardous materials release.<br>*Timing: Plan preparation prior to issuance of a grading permit; plan implementation during earthwork and construction activities.* | Applicable to the proposed project. |
| | I7. Removal of aboveground or underground fuel tanks is required in accordance with the requirements of the Livermore-Pleasanton Fire Department, if these are to be removed as part of development under the Specific Plan.<br>*Timing: Prior to commencement of development activity on each applicable site.* | Applicable to the proposed project. |
| | I8. Demolition of structures is required in accordance with applicable requirements of the California Department of Industrial Relations (Cal/OSHA) for lead, with appropriate follow-up measures if lead-based paint is found.<br>*Timing: In conjunction with and following development activity on each applicable site.* | This mitigation measure is not applicable to the proposed project because no structures would be demolished as part of the project. |
| | I9. Demolition of structures is required in accordance with the requirements of Cal/OSHA and the Bay Area Air Quality Management District (BAAQMD) for asbestos, with appropriate follow-up measures if asbestos is found.<br>*Timing: In conjunction with and following development activity on each applicable site.* | This mitigation measure is not applicable to the proposed project because no structures would be demolished as part of the project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | I10. Notification of the Underground Service Alert (USA) as well as site tenants is required prior to groundbreaking, to obtain information on the existing location of underground utilities.<br><br>*Timing: Prior to groundbreaking on each development site.* | Applicable to the proposed project. |
| | I11. Contact with the Alameda County Mosquito Abatement District is required for assistance in controlling and managing potential disease-bearing vectors and their breeding areas (e.g., lakes, detention basins, springs), to reduce the potential for transmission of public health diseases associated with these organisms.<br><br>*Timing: Prior to issuance of a grading permit on each applicable site.* | Applicable to the proposed project. |
| Biology | J1. A California Tiger Salamander Mitigation and Monitoring Plan must be prepared and submitted to the California Department of Fish and Game (DFG) for review and approval. Approval of the plan must be obtained from DFG.<br><br>*Timing: Prior to the issuance of any grading permits that affect tiger salamander habitat.* | Applicable to the proposed project. |
| | J2. A mitigation plan for California red-legged frog must be prepared in consultation with the U.S. Fish & Wildlife Service (USF&WS) in support of a Section 7 Consultation. The mitigation plan must be submitted to the U.S. Army Corps of Engineers (Corps) as part of the Section 404 permit process. A Biological Opinion must be obtained from USF&WS.<br><br>*Timing: Prior to the issuance of any grading permits that affect Red-legged frog habitat.* | This mitigation is not applicable to the proposed project because no California red-legged frogs or habitat were identified on-site in the biological field surveys. |
| | J3. A preconstruction survey of the Spotorno residential development areas (Spotorno Flat and Upper Valley), Golf Course, and Golf Course Housing areas must be completed to verify the presence or absence of active raptor nests. If any active nests are found, construction must be scheduled so that it will not result in removal or abandonment of an active raptor nest.<br><br>*Timing: Prior to the start of construction activities.* | Applicable to the proposed project. |
| | J4. If construction will affect Pond 3 (located in the hills east of the Spotorno Flat Area), a preconstruction survey of the pond must be completed to verify the presence or absence of active Tricolored blackbird nests.<br><br>*Timing: Prior to the start of construction activities.* | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | J5. All development, including residential uses and trails, must be set back at least 100 feet from the centerline of Sycamore Creek, or at least 10 feet from the outermost drip line of the existing riparian woodland, whichever is greater.<br>*Timing: Prior to development plan approval for applicable areas.* | This mitigation is not applicable to the proposed project because the project site is not within 100 feet of Sycamore Creek. |
| | J6. DFG must be consulted regarding any areas subject to their jurisdiction prior to any encroachment into a designated corridor, and/or consultation with the Corps prior to any activity that would occur within the jurisdictional limits of wetlands or within the bed and bank of a waters of the U.S.<br>*Timing: Prior to the issuance of a grading permit in applicable areas.* | The first half of the mitigation requiring consultation with DFG regarding any areas subject to their jurisdiction would not apply to the project because there is no riparian corridor or related riparian habitat on-site. The second half of the mitigation requiring consultation with the Corps would be applicable. |
| | J7. Appropriate permits and/or agreements must be obtained from regulatory agencies (DFG, USF&WS, and/or Corps) prior to realignment of Happy Valley Creek or encroachment into the buffer zone of Sycamore Creek, as defined above.<br>*Timing: Prior to the issuance of a grading permit in applicable areas.* | This mitigation is not applicable to the proposed project because development would not take place in the buffer zone of Happy Valley Creek or Sycamore Creek. |
| | J8. Riparian Restoration Plans are required for the Project Area. Plans must discuss anticipated impacts and proposed mitigation measures associated with the proposed realignment of Happy Valley Creek and any other affected riparian corridors in the Project Area subject to the jurisdiction of DFG and/or the Corps. Plans will be used to support applications for permits from DFG and the Corps.<br>*Timing: Prior to the issuance of a grading permit in applicable areas.* | This mitigation is not applicable to the proposed project because development would not take place within a riparian area. |
| | J9. Master Landscape Plans and Tree Preservation Plans are required for the Project Area. These plans should include the following provisions.<br>• Avoidance of heritage trees to the extent possible.<br>• Prohibition on the placement of any chemical or other deleterious substance or material on any heritage tree.<br>• Prohibition on disturbance of the soil or placement | This mitigation would not apply to the proposed project because development of the project would not require removal of any trees. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | of any chemical or other deleterious sub- stance or material on the soil within the drip line area of any heritage tree.<br>• Replacement of any trees that are removed "inch for inch" (in other words, for each inch of dbh lost), an equal amount of replacement inches would be planted, or planting two to three times the number of individual trees lost, or a combination of these measures, at the discretion of the City of Pleasanton. (These measures are recommended in the Tree Survey and Arborist Report for Happy Valley Specific Plan EIR.)<br>*Timing: Prior to the issuance of a grading permit in applicable areas.* | |
| | J10. (EIR Mitigation Measure J1) Provide such additional mitigation of wetland impacts as may be required by the Army Corps of Engineers upon its review of applications for fill permits. The Corps may find the mitigations adequate, or may require additional measures preliminary to issuing fill permits.<br>*Timing: Prior to the issuance of grading permits for the applicable areas.* | Applicable to the proposed project. |
| Cultural Resources | K1. The old hay barn located on Lot 101 shall be preserved and restored, if feasible. If restoration proves infeasible, then upon acquisition of Lot 101 for the Golf Course, the City shall consider reconstructing the barn elsewhere within the Plan Area using the existing design and materials. If reconstruction also proves infeasible, the barn shall be documented through a combination of large- format photography or architectural renderings in combination with archival research. A technical report of findings shall be prepared to present the results of research and documentation, and the report shall be submitted to local historic societies and libraries and the Northwest Information Center at Sonoma State University.<br>*Timing: Determine feasibility of preserving the barn prior to approval of a development plan for the Golf Course; if infeasible, complete other requirements prior to issuance of any permit that would affect the barn (e.g., grading permit, demolition permit).* | This mitigation measure is not applicable to the proposed project because Lot 101 is not located within the proposed project's boundary. |
| | K2. If previously undiscovered historic or prehistoric resources are encountered during construction, work in the immediate area shall cease until such time that a qualified archaeologist has an opportunity to evaluate | Applicable to the proposed project. |

## Table 3 (cont.): All Mitigation Measures Contained in the HVSP MMRP

| Impact Resource | Mitigation Measure | Applicability |
|---|---|---|
| | the find and make recommendations for mitigation, if warranted.<br><br>*Timing: During construction.* | |
| Visual Resources | See Table 2. | Applicable to the proposed project. |
| Public Services: Fire Protection | O1. To protect new development from fire hazards, all residential structures located beyond the five- minute response time from the nearest fire station as well as the Golf Course clubhouse must be equipped with automatic fire sprinklers and Class A fire-retardant roofing, and new homes within the five-minute response time area are to be protected with at least Class B roofing.<br><br>*Timing: Inclusion of sprinklers and designation of roofing materials to be confirmed prior to issuance of building permits and during construction inspections.* | Applicable to the proposed project. |
| | O2. Use of wood shakes and shingles on new homes and on the Golf Course clubhouse is prohibited.<br><br>*Timing: Roofing specifications to be shown on building plans prior to issuance of building permits.* | This mitigation measure is not applicable to the proposed project because wood shakes and shingles are prohibited by the City of Alameda for use in residential developments |

Notes:
[1] The numbering for this mitigation was not sequential in the MMRP. The numbering has been revised to follow sequentially.
Source: HVSP MMRP, 1998.

# Appendix K:
# Utilities and Service Systems Supporting Information

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# K.1 - Happy Valley Water & Sewer Study

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# Technical Memorandum

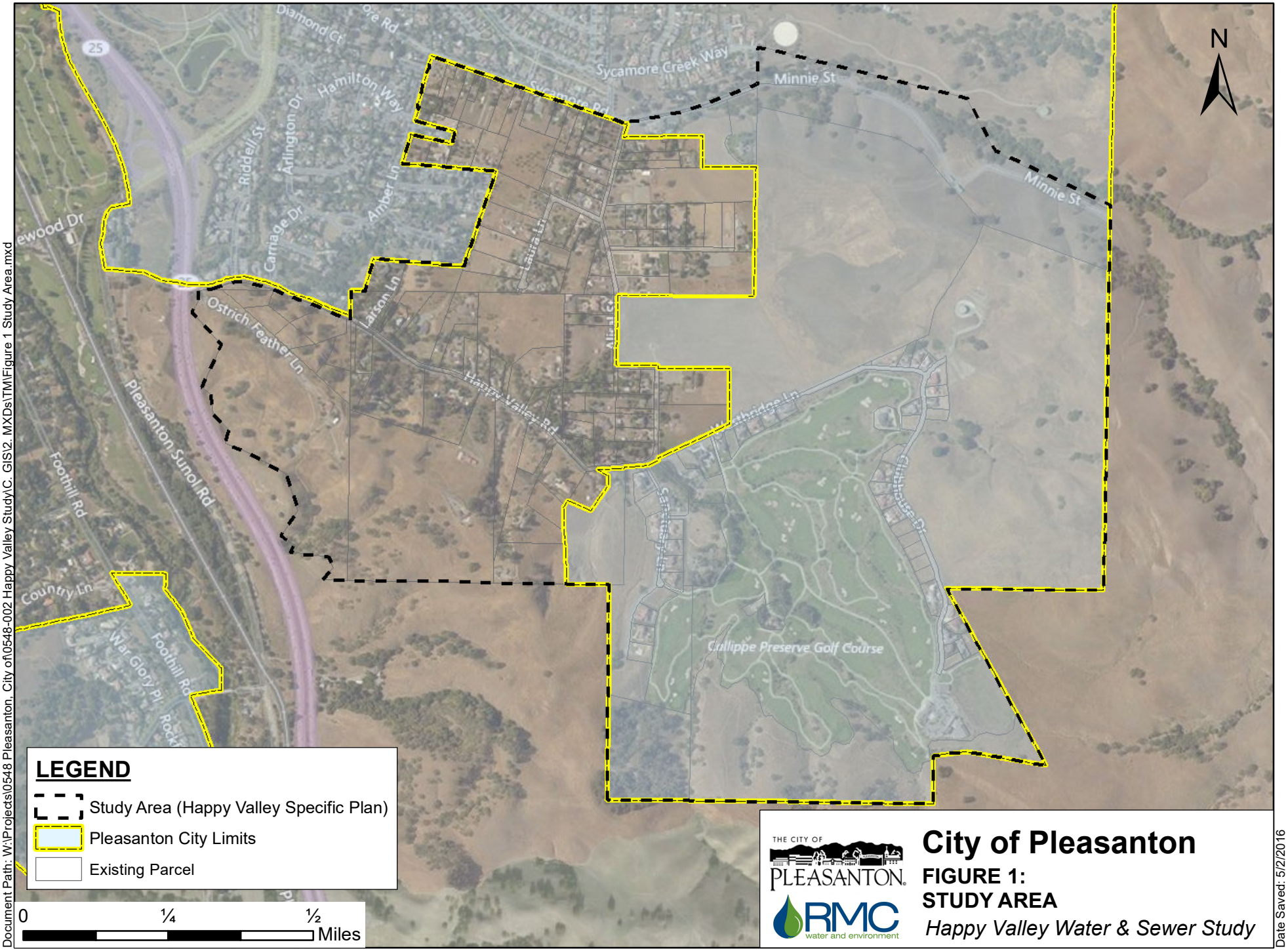
**Happy Valley Water & Sewer Study**

| | |
|---|---|
| **Subject:** | Happy Valley Water & Sewer Study Technical Memorandum |
| **Prepared For:** | City of Pleasanton |
| **Prepared by:** | Chris van Lienden, RMC Water and Environment<br>PE No. 75034, Expiration Date: 12/31/2017<br>James Kohne, RMC Water and Environment |
| **Reviewed by:** | Mike Matson, RMC Water and Environment<br>Gisa Ju, RMC Water and Environment |
| **Date:** | November 21, 2016 |
| **Reference:** | 0548-002 |

## 1 Introduction

The Happy Valley Study Area includes the study area identified in the Happy Valley Specific Plan (Specific Plan), shown in **Figure 1**. The Specific Plan identified future residential development, as well as development of a golf course. Some of this development has been completed, including the golf course. Since the Specific Plan was completed, a portion of the Study Area was annexed into the City, with water and sewer infrastructure installed to meet the demands of that annexed area. The City is considering extension of sewer and water utilities to of the remainder of the Specific Plan study area; however, the existing water and sewer facilities may have insufficient capacity to serve the Specific Plan's potential future developments. In addition, the existing water and sewer mains do not extend to all parcels within the study area; additional infrastructure will be required to extend water and sewer service to these parcels.

The purpose of this study is to evaluate whether improvements would be needed to the existing water and sewer facilities; to identify the new facilities that would be needed to serve the future Happy Valley; and to estimate the capital costs of these improvements.

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# 2 Land Use Scenarios

This study is based on land use as described in the Specific Plan. Two land use scenarios were considered in this evaluation:

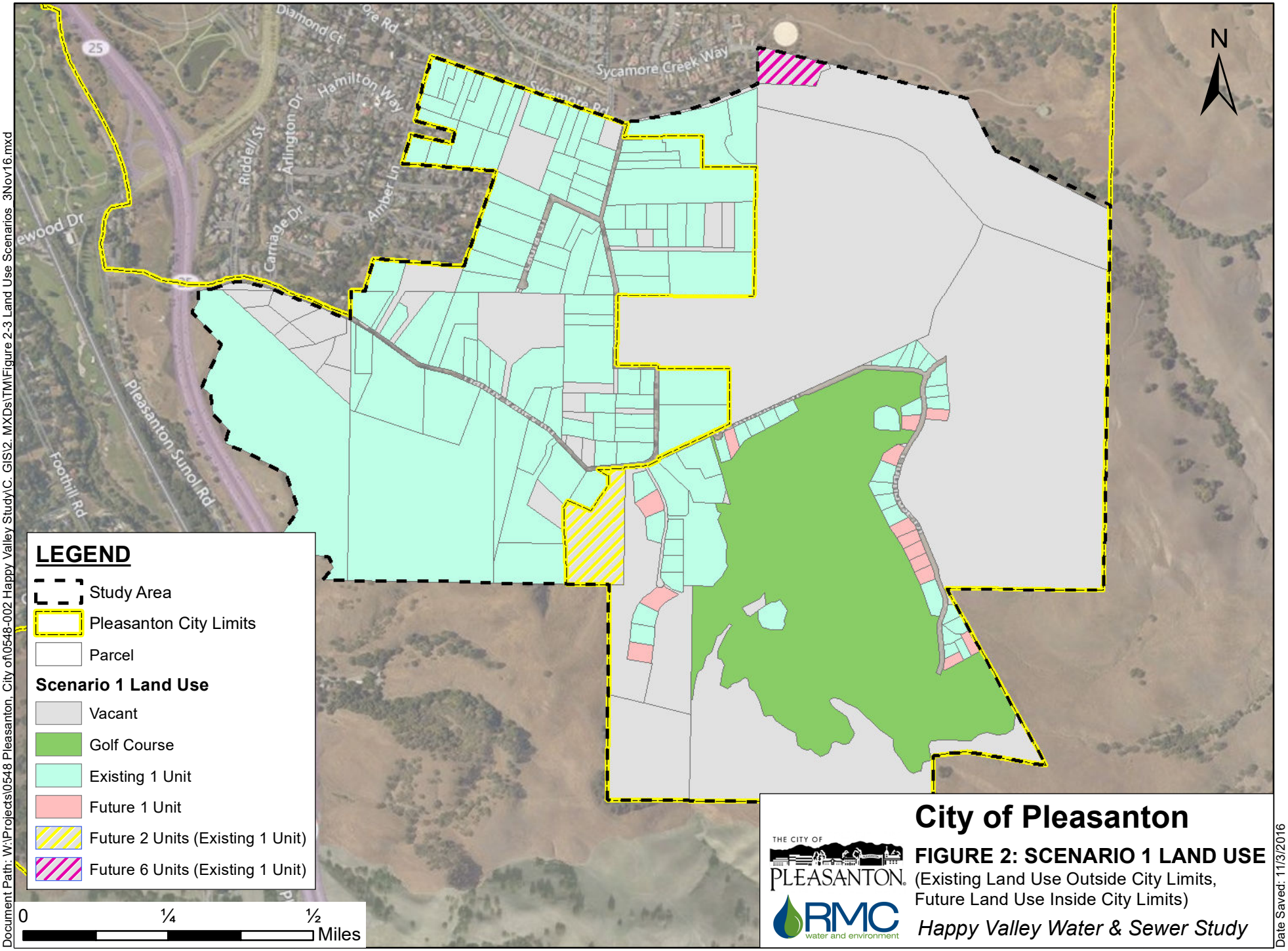
Scenario 1 – Existing land use outside City limits (estimated at 92 residential units)

Scenario 2 – Buildout land use outside City limits (estimated at 125 residential units)

Previously completed facilities were assumed to be designed with sufficient capacity to serve buildout land uses within the City annexed portion of the study area. Therefore, both land use scenarios assume buildout land use within City limits.

These scenarios are shown in **Figure 2** and **Figure 3**. A list of all parcels in the study area and the assumed number of units is included in Appendix A.

Of the 92 parcels in the unincorporated Happy Valley area under Scenario 1, there are 10 parcels already connected to both sewer and water, 4 parcels already connected to water only, and 6 properties already connected to sewer only. These parcels are along the edge of Happy Valley so their connection to existing nearby City utilities was relatively easy. For purposes of this study these already connected parcels are assumed to pay their share of the cost to extend utilities into the remainder of the unincorporated Happy Valley area. If they are excluded from paying, the number of parcels paying for the extension of utilities will decrease, and the cost per unit shown in the sections below will increase. Appendix A shows which parcels are connected to utilities.




# City of Pleasanton

THE CITY OF PLEASANTON

RMC water and environment

**FIGURE 2: SCENARIO 1 LAND USE**
(Existing Land Use Outside City Limits, Future Land Use Inside City Limits)

*Happy Valley Water & Sewer Study*

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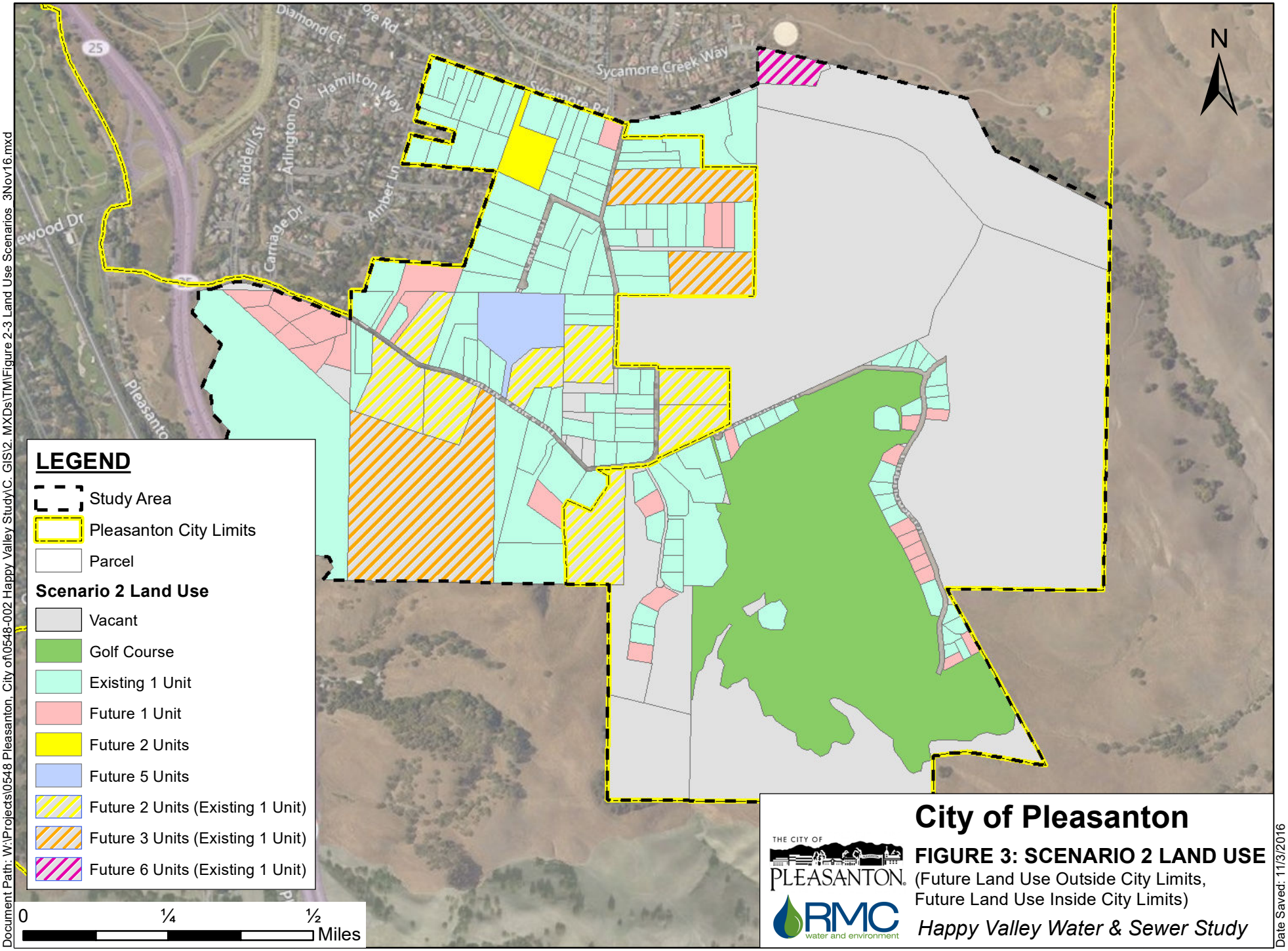


# City of Pleasanton

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**FIGURE 3: SCENARIO 2 LAND USE**

(Future Land Use Outside City Limits, Future Land Use Inside City Limits)

*Happy Valley Water & Sewer Study*

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# 3 Water System Evaluation

This section describes the evaluation process and results for extending water mains and associated facilities to parcels within the Study Area but outside current City limits. The City's existing water distribution system has sufficient capacity to meet the City's criteria for minimum pressures, maximum velocity, and allowable headloss under both scenarios. Distribution system modeling has not been performed.

## 3.1 Evaluation Criteria

Evaluation criteria used in the development of facilities and cost estimates for the water system are described in this section. Evaluation criteria include sizing and siting criteria for new facilities needed to extend service, and the cost criteria used to estimate capital costs associated with implementation of those facilities.

### 3.1.1 Sizing and Siting Criteria

All proposed pipelines are sized to convey peak flow conditions under both land use scenarios. Pipe sizing and flow criteria are presented in **Table 1**; and are based on the City's 1984 Water System Design Standards and recommendations in the 2004 Water Master Plan. Pipeline alignments are based on siting information from the Happy Valley Specific Plan and discussions with City staff. As noted above, it has been assumed that existing piping is sufficiently sized to meet City requirements. All proposed pipelines were evaluated for maximum velocity and headloss; flow rates through proposed pipelines have been estimated based on likely service locations and flow paths.

### 3.1.2 Cost Criteria

A planning-level construction cost estimate for each water distribution system component has been developed. Costs are considered accurate within +(20 to 50)% and -(15 to 30)%, consistent with AACE International Class 4 estimate (Study or Feasibility Level). These estimates are suitable for budget forecasting, CIP development, and project evaluations, with the understanding that refinements to the project details and costs would be necessary as projects proceed into the design and construction phases.

Unit capital costs are based on engineering experience, recent bid prices for similar projects (including the City's recent Recycled Water Expansion project), and RS Means[1]. Unit costs are indexed to the February 2016 Engineering News Record Construction Cost Index 20 Cities Average (10,182). Where appropriate, a sales tax rate of 9.5% has been applied. Allowances have been added for project-specific costs (such as mobilization and demobilization and traffic control for work in roadways). All unit costs are fully burdened (raw construction cost plus contractor markups, taxes, overhead and profit).

Pipeline construction costs have been estimated based on separate unit cost items for the pipelines, joint restraints, fittings, pot-holing, traffic control, trench excavation, and re-surfacing. Cathodic protection for ductile iron fittings has also been included. Quantities are calculated based on the evaluation results or estimated based on RMC experience with similar sized pipeline installation projects.

Pressure reducing station costs include separate unit costs for the pressure reducing valve, gate valves, and vault. Excavation costs are included in the estimated costs for pipeline construction.

#### Implementation Costs and Allowances

Implementation costs are defined as those non-construction costs associated with a project. These costs can include the following:

[1] RS Means Company. (2016). *Heavy Construction Cost Data*, Kingston, MA, R.S. Means Co.,

- Environmental, Legal, and Administrative (ELA) Allowance
    - Owner's administration costs
    - Owner's legal costs associated with contracting and related issues
    - Environmental documentation (CEQA and NEPA compliance)
- Engineering/Construction Management (CM) Allowance
    - Permitting
    - Engineering
    - Construction management and inspection
- Project Contingency
    - For unknown cost items, based on the level of design development of the project facilities.

Implementation allowances were applied as summarized in **Table 2**.

**Table 1: Water System Siting and Sizing Criteria**

| Category | Value |
|---|---|
| **General Criteria** | |
| Pipe Material for new Mains | PVC C900 SDR 18 |
| Minimum Cover[1] | 3.5 feet |
| Valves[1] | Minimum number of valves as follows:<br>• At cross intersection – 3<br>• At tee intersection – 2<br>• On straight runs so that there shall not be more than 800' between valves. Except in high value areas where maximum spacing is 500'<br>• On all hydrant laterals<br>PRV station between pressure zones |
| Hydrants[1] | • One hydrant within 250' of any existing or proposed structure<br>• In addition, two hydrants within 500' of any commercial multiple, residential, industrial or school building |
| **Sizing Criteria[2]** | |
| Minimum pipe size[1] | • 6" for any line.<br>• 8" under the following conditions<br>o Dead end longer than 500'.<br>o Straight runs longer than 1000' without reinforcement |
| Maximum Velocity[3] | 5 feet per second (non-fire flow conditions) |
| Maximum allowable headloss[3] | 10 feet per 1000 feet (non-fire flow conditions) |
| Hazen Williams C for new PVC[3] | 130 |
| **Flow Criteria** | |
| Residential Average Day Demand[4] | 0.39 gpm per dwelling unit equivalent (DUE) |
| Maximum Day/Average Day Peaking Factor[2] | 2.2 |
| Peak Hour/Maximum Day Peaking Factor[2] | 2.5 |
| Peak Hour/Average Day Peaking Factor | 5.5 |

Footnotes:
1. Per 1984 Design Standards
2. It has been assumed that the existing water distribution system has capacity to meet the City's minimum requirements for pressure under both land use scenarios.
3. Per recommendations in 2004 Water Master Plan.
4. Average day demand assumed for Happy Valley Specific Plan in Table B-1 of the 2004 Water Master Plan

**Table 2: Implementation Allowances**

| Element | Values for Other Facilities |
|---|---|
| 1. Raw Construction Cost | Raw Construction |
| Environmental, Legal, and Administrative (ELA) Allowance | 10% |
| Engineering/Construction Management (CM) Allowance | 15% |
| 2. Raw Cost + Engineering + Implementation Allowances | 1.25 x Raw Construction |
| Project Contingency | 20% |
| 3. Total Capital (Fully Loaded) Cost | 1.5 x Raw Construction |

## 3.2 Water System Evaluation Results

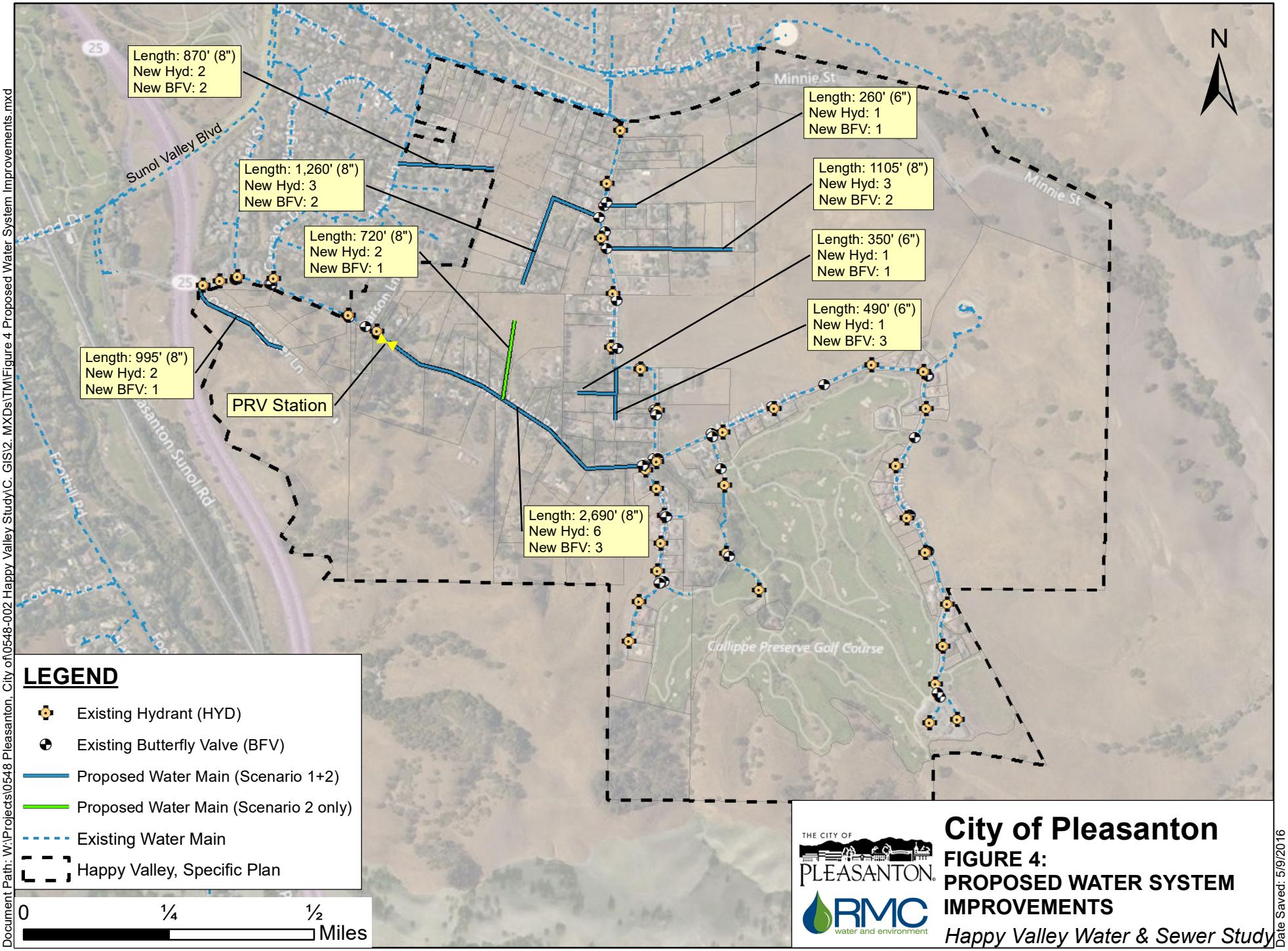
Improvements required to extend water service are identified in Figure 4. All proposed pipeline segments would have a maximum non-fire velocity and headloss significantly below the 5 fps and 10 ft/1000 ft required by the City, under both land use scenarios. Therefore, there is no difference in pipeline sizing between Scenario 1 and Scenario 2. However, additional pipelines are required above those needed for Scenario 1 to serve parcels that are not currently developed (Scenario 2). These pipelines have been identified in Figure 4. Quantities of new hydrants and valves per segment of proposed pipe are also identified in Figure 4.

Cost of the improvements are summarized in **Table 3** and a more detail breakdown is included in Appendix B.

**Table 3: Water Improvements Cost Estimate Summary**

| Item | | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|---|
| | | Quantity | Estimated Cost | Quantity | Estimated Cost |
| Piping | 8” | 6,920 LF | $1,128,000 | 7,640 LF | $1,245,000 |
| | 6” | 1,100 LF | $174,000 | 1,100 LF | $174,000 |
| Hydrants | | 19 | $62,000 | 21 | $69,000 |
| PRV Station | | 1 | $22,000 | 1 | $22,000 |
| Butterfly Valves | | 15 | $12,000 | 16 | $13,000 |
| **Raw Construction Subtotal*** | | | $1,400,000 | | $1,520,000 |
| Implementation Costs (25%)* | | | $350,000 | | $380,000 |
| **Capital Cost Subtotal** | | | $1,750,000 | | $1,900,000 |
| Project Contingency (20%)* | | | $350,000 | | $380,000 |
| **Capital Cost Total** | | | **$2.1 million** | | **$2.28 million** |
| # Units | | | 92 | | 125 |
| **Capital Cost Per Parcel** | | | **$22,000** | | **$18,000** |

* Rounded to the nearest $10,000




# City of Pleasanton

**FIGURE 4:**
**PROPOSED WATER SYSTEM IMPROVEMENTS**

*Happy Valley Water & Sewer Study*

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# 4 Sewer System Evaluation

This section describes the evaluation process and results for extending sewer mains and associated facilities to parcels within the Study Area but outside current City limits. The capacity of the existing sewer collection system to the sewer trunk on Sunol Boulevard has also been evaluated to determine any necessary improvements, including two existing pump stations: S-12 and S-14. There is currently sufficient capacity available in all trunk sewers downstream of the Sunol Boulevard connection, including sewer flows from the Happy Valley study area.

## 4.1 Evaluation Criteria

Evaluation criteria used in the development of facilities and cost estimates for the sewer system are described in this section.

### 4.1.1 Sizing and Siting Criteria

Pipe sizing and flow criteria are summarized in **Table 4**, and are based on the City's 1984 Sewer System Design Standards and recommendations included in the 2007 Wastewater Master Plan. Pipeline alignments are based on siting information from the Happy Valley Specific Plan and discussions with City staff. The firm capacities of pump stations S-12 and S-14 were also compared to the potential peak wet weather flow (PWWF) rates. Existing sewer facilities in the Study Area are shown in **Figure 5**.

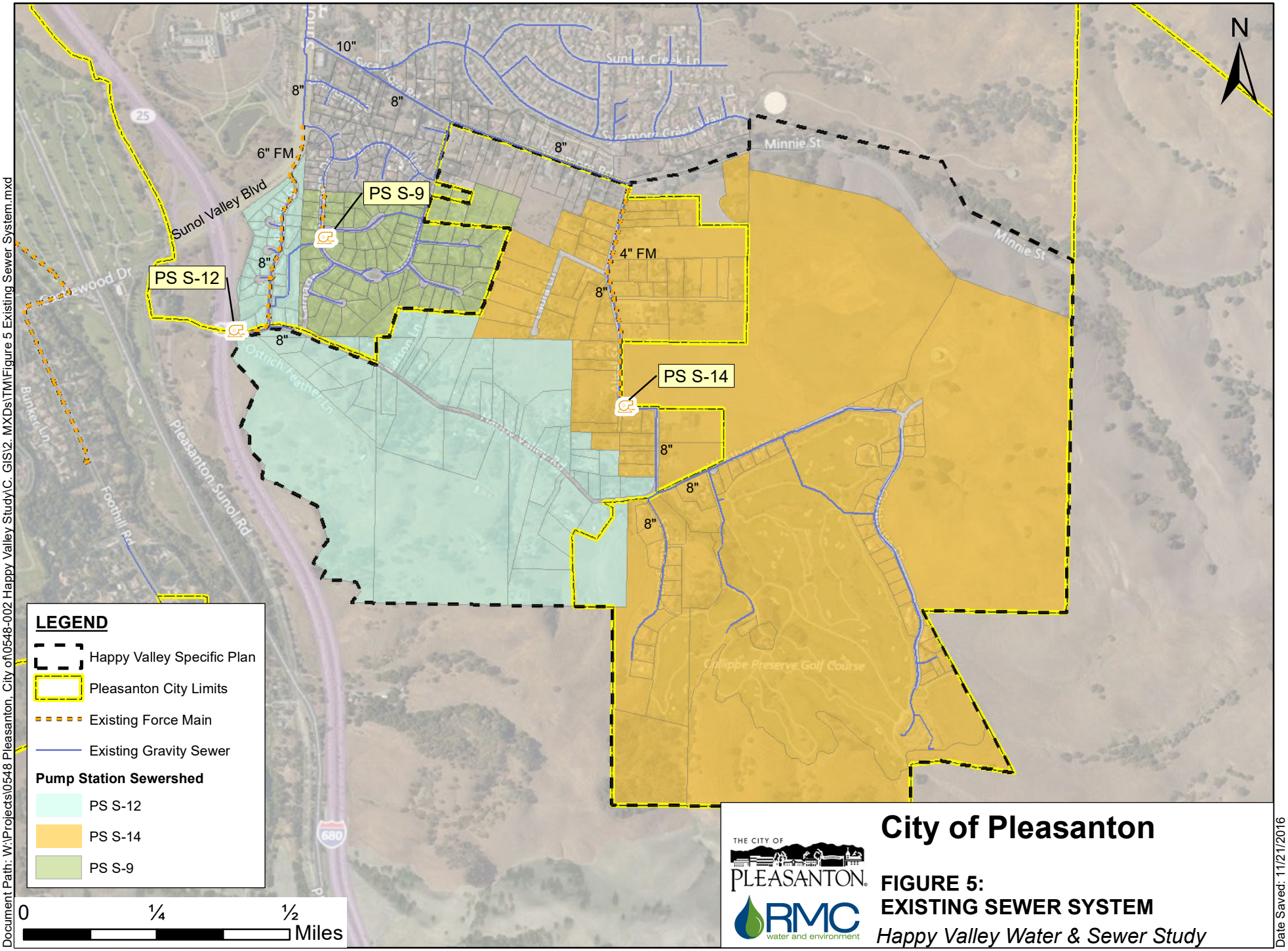
### 4.1.2 Cost Criteria

Similar to the water system evaluation, planning-level construction cost estimates for each sewer collection system component have been developed to the same level of accuracy as the water system (AACE Class 4). Costs are indexed to the February 2016 Engineering News Record Construction Cost Index 20 Cities Average (10,182).

Costs for new sewer construction were estimated based on RMC's experience with similar projects and recent bids. Cost criteria include baseline fully burdened unit construction costs for gravity sewers. Costs associated with pipeline construction, including excavation, street reconstruction, and manholes are included in the unit cost for sewer pipeline construction. Allowances have been added to the baseline construction cost for project-specific costs (such as mobilization and demobilization, remove and replace construction, and traffic control for work in roadways). Open-cut construction methods are assumed for all pipeline improvements.

Costs for gravity sewers vary with pipe diameter and depth. Depth has been estimated based on the City's minimum depth of cover (five feet), appropriate pipe slopes, and topographic data provided by the City.

Implementation allowances are the same factors that were applied for the water system cost estimates evaluation, and are summarized in **Table 2**.




# City of Pleasanton

THE CITY OF PLEASANTON

RMC water and environment

**FIGURE 5:**
**EXISTING SEWER SYSTEM**

*Happy Valley Water & Sewer Study*

Document Path: W:\Projects\0548 Pleasanton, City of\0548-002 Happy Valley Study\C. GIS\2. MXDs\TM\Figure 5 Existing Sewer System.mxd

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**Table 4: Sewer System Siting and Sizing Evaluation Criteria**

| Category | Value |
|---|---|
| **General Critiera** | |
| Pipe Material for new Sewer Mains | PVC |
| Minimum cover[1] | 5 feet |
| Maximum distance between manholes[1] | 350 feet |
| **Gravity Pipeline Sizing Criteria** | |
| Minimum pipe size[1] | 8-inch diameter |
| Maximum d/D[1] | 0.75 |
| Minimum Slope[1] | 8" 0.003 ft/ft<br>10" 0.0025 ft/ft |
| Minimum Velocity[1] | 2 feet per second |
| Maximum Velocity[1] | 10 feet per second |
| Manning's 'n' for gravity sewers[2] | 0.013 |
| **Pump Station Criteria** | |
| Minimum force main pipe size | 6" |
| Maximum Velocity[3] | 5 feet per second |
| Pump Configuration | 1 duty +1 standby |
| Pump Efficiency[3] | 70% |
| Hazen Williams 'C' for new and existing force mains[3] | 100 |
| **Flow Criteria** | |
| Residential ADWF[4] | 220 gpd per dwelling unit equivalent |
| Golf Course ADWF[4] | 35,561 gpd |
| PWWF/ADWF Peaking Factor[5] | 3.2 |

Footnotes:
1. Per 1984 Design Standards
2. Per 2007 Wastewater Master Plan
3. Typical values used for similar systems
4. Residential and Golf Course ADWF are based on calibrated values used in the 2007 Wastewater Collection System Master Plan. The 1984 Design standards assume a flowrate of 320 gpd per Dwelling Unit and a peaking factor of 2.0.
5. Peaking factor is based on the PWWF/ADWF ratio for the entire system reported in Table 6.2 of the 2007 Wastewater Collection System Master Plan. Note that this peaking factor is more conservative than the peaking factor of 2.0 used in the 1984 Design Guidelines, but is not based on location specific infiltration and inflow factors. A calibrated dynamic model may indicate a higher or lower peaking factor should be used.

## 4.2 Sewer System Evaluation Results

Proposed improvements to the sewer system are shown in **Figure 6**.

### Gravity Sewers

A steady state model was developed to evaluate the capacity of existing and proposed gravity sewers. The modeling software used for the study was InfoWorks CS™ by Innovyze; although InfoWorks uses a fully-dynamic hydraulic model engine, only fixed flow rates were evaluated. Per unit flowrates were based on average dry weather flowrates (ADWF) and peaking factors summarized in **Table 4**. Flows generated by

each parcel were applied to the upstream end of the nearest pipe. Based on the results of this modeling, the existing sewers have sufficient capacity for flows under both Scenario 1 and Scenario 2. Hydraulic profiles for all affected gravity pipelines have been included in Appendix C. Hydraulic profiles included in Appendix C represent Scenario 2 flows; since no surcharge occurs under Scenario 2 flows, hydraulic profiles under Scenario 1 were not included. Profiles A to F include proposed new sewers, and Profiles G and H include only existing sewers that would convey flow from the Study Area.

The proposed pipelines have been organized into seven projects for cost estimating purposes, as identified in **Figure 6**.

## Pump Stations and Force Mains

Estimated flowrates and firm capacities for pump stations S-12 and S-14 are summarized in **Table 5**. The sewersheds assumed for each force main are identified in Appendix C.

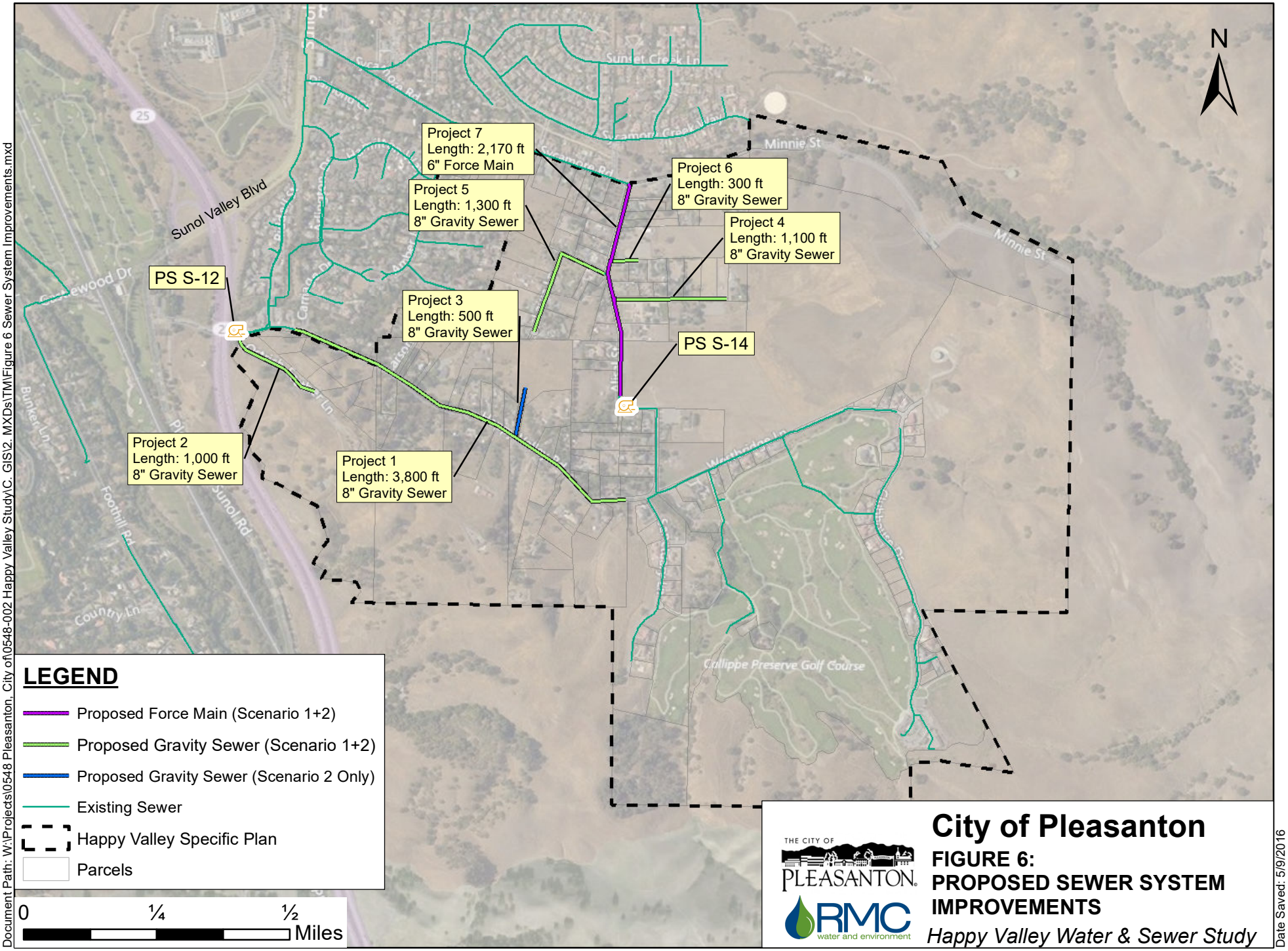
Pump station capacities were estimated based on pump curves provided by the City and a force main Hazen Williams coefficient of 100. The existing force main attached to the S-14 pump station is 4-inch diameter. As the City requires a 6-inch minimum diameter for force mains, it has been assumed that the 4-inch pipeline would be replaced with a 6-inch force main. The capacity of the S-14 force main presented in **Table 5** is based on a 6-inch diameter pipe. Pump and system curves for each pump station are included in Appendix D.

As indicated in the Table, both pump stations have adequate capacity to handle the projected PWWF from their respective tributary areas.

**Table 5: Pump Station Capacity**

| Pump Station | Firm Capacity (gpm) | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|---|
| | | ADWF (gpm) | PWWF (gpm) | ADWF (gpm) | PWWF (gpm) |
| S-12 | 340 | 10 | 32 | 14 | 44 |
| S-14 | 368[1] | 43 | 134 | 42 | 133 |

Footnotes:
1. Assumes existing 4” force main is replaced with a new 6” force main.


N
Project 7
Length: 2,170 ft
6" Force Main
Project 6
Length: 300 ft
8" Gravity Sewer
Project 5
Length: 1,300 ft
8" Gravity Sewer
Project 4
Length: 1,100 ft
8" Gravity Sewer
PS S-12
Project 3
Length: 500 ft
8" Gravity Sewer
PS S-14
Project 2
Length: 1,000 ft
8" Gravity Sewer
Project 1
Length: 3,800 ft
8" Gravity Sewer
Sunol Valley Blvd
Minnie St
Sunol Rd
Foothill Rd
Country Ln
Bunker Ln
Sycamore Creek Lane
Callippe Preserve Golf Course
LEGEND
Proposed Force Main (Scenario 1+2)
Proposed Gravity Sewer (Scenario 1+2)
Proposed Gravity Sewer (Scenario 2 Only)
Existing Sewer
Happy Valley Specific Plan
Parcels
0
¼
½
Miles
THE CITY OF PLEASANTON
RMC water and environment
City of Pleasanton
FIGURE 6:
PROPOSED SEWER SYSTEM IMPROVEMENTS
Happy Valley Water & Sewer Study
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### Cost Estimate

Cost of the improvements are summarized in **Table 6** and a more detailed breakdown is included in Appendix E. Note that Project 3 is required only to serve parcels that are not currently developed and would therefore only be required for Scenario 2. These pipelines are indicated in **Figure 6**.

**Table 6: Sewer Improvements Cost Estimate Summary**

| | Scenario 1 | | Scenario 2 | |
|---|---|---|---|---|
| Item | Quantity | Estimated Cost | Quantity | Estimated Cost |
| 8" Gravity Sewer | 7,400 | $1,820,000 | 7,895 | $1,930,000 |
| 6" Force Main | 2,200 | $350,000 | 2,200 | $350,000 |
| Raw Construction Subtotal* | | $2,170,000 | | $2,280,000 |
| Implementation Costs (25%)* | | $540,000 | | $570,000 |
| Capital Cost Subtotal | | $2,710,000 | | $2,850,000 |
| Project Contingency (20%)* | | $540,000 | | $570,000 |
| **Capital Cost Total** | | **$3.25 million** | | **$3.42 million** |
| # Units | | 92 | | 125 |
| **Capital Cost Per Parcel** | | $35,000 | | $27,000 |

* Rounded to the nearest $10,000

# 5 Summary

Total estimated costs for water distribution and wastewater collection system improvements under Scenario 1 and Scenario 2 are summarized in **Table 7**.

**Table 7: Total Estimated Capital Costs**

| | Scenario 1 Estimated Cost (millions) | Scenario 2 Estimated Cost (millions) |
|---|---|---|
| Water System Facilities | $1.40 | $1.52 |
| Sewer System Facilities | $2.17 | $2.28 |
| **Raw Construction Subtotal*** | $3.57 | $3.80 |
| Implementation Costs (25%)* | $0.89 | $0.95 |
| **Capital Cost Subtotal** | $4.46 | $4.75 |
| Project Contingency (20%)* | $0.89 | $0.95 |
| **Capital Cost Total** | **$5.35 million** | **$5.7 million** |
| # Units | 92 | 125 |
| **Capital Cost Per Unit** | **$58,000** | **$46,000** |

* Rounded to the nearest $10,000

# Appendix A: Parcel Database

**Happy Valley Water and Sewer Study**

Appendix A - Parcel Database

| Parcel APN | Jurisdication | Scenario 1 Dwelling Units | Scenario 2 Dwelling Units | Existing Connections |
|---|---|---|---|---|
| 949 000600101 | County | 1 | 1 | sewer |
| 949 000600104 | County | 1 | 1 | sewer |
| 949 000600105 | County | 1 | 1 | sewer |
| 949 000600106 | County | 1 | 1 | |
| 949 000600300 | County | 1 | 1 | water & sewer |
| 949 000600403 | County | 1 | 1 | water & sewer |
| 949 000600405 | County | 1 | 1 | |
| 949 000600503 | County | 1 | 1 | |
| 949 000600506 | County | 1 | 1 | |
| 949 000600600 | County | 1 | 1 | |
| 949 000600704 | County | 1 | 1 | |
| 949 000600705 | County | 1 | 1 | |
| 949 000600800 | County | 1 | 1 | water & sewer |
| 949 000600900 | County | 1 | 1 | |
| 949 000700102 | County | 1 | 1 | |
| 949 000700103 | County | 1 | 1 | |
| 949 000700104 | County | 1 | 1 | |
| 949 000700108 | County | 1 | 1 | water & sewer |
| 949 000700109 | County | 0 | 1 | |
| 949 000700203 | County | 1 | 1 | |
| 949 000700205 | County | 1 | 1 | |
| 949 000700207 | County | 1 | 1 | |
| 949 000700208 | County | 1 | 1 | |
| 949 000700210 | County | 1 | 1 | |
| 949 000700309 | County | 1 | 1 | |
| 949 000700310 | County | 0 | 0 | |
| 949 000700314 | County | 1 | 1 | water & sewer |
| 949 000700401 | County | 1 | 1 | |
| 949 000700402 | County | 1 | 1 | |
| 949 000700500 | County | 1 | 1 | water & sewer |
| 949 000700601 | County | 1 | 2 | |
| 949 000700602 | County | 1 | 1 | |
| 949 000700700 | County | 1 | 1 | |
| 949 000700800 | County | 1 | 1 | sewer |
| 949 000700905 | County | 1 | 1 | |
| 949 000700906 | County | 1 | 1 | |
| 949 000700907 | County | 0 | 0 | |
| 949 000700910 | County | 0 | 0 | |
| 949 000700911 | County | 1 | 1 | |
| 949 000700913 | County | 0 | 0 | |
| 949 000700914 | County | 1 | 1 | |
| 949 000700917 | County | 0 | 0 | |
| 949 000700919 | County | 1 | 1 | |
| 949 000700920 | County | 0 | 0 | |
| 949 000700921 | County | 0 | 0 | |
| 949 000700922 | County | 1 | 1 | |
| 949 000701001 | County | 1 | 1 | sewer |
| 949 000701003 | County | 0 | 0 | |
| 949 000701005 | County | 0 | 0 | |
| 949 000701006 | County | 1 | 1 | |
| 949 000701100 | County | 1 | 1 | |
| 949 000701200 | County | 1 | 1 | |
| 949 000701302 | County | 1 | 1 | |
| 949 000701303 | County | 1 | 1 | |
| 949 000701304 | County | 0 | 5 | |
| 949 000701305 | County | 1 | 2 | |
| 949 000701402 | County | 1 | 1 | |
| 949 000701403 | County | 1 | 1 | |
| 949 000701404 | County | 1 | 1 | |
| 949 000701602 | County | 0 | 2 | |
| 949 000701603 | County | 1 | 1 | |

Source: Happy Valley Specific Plan (1998)

| Parcel APN | Jurisdication | Scenario 1 Dwelling Units | Scenario 2 Dwelling Units | Existing Connections |
|---|---|---|---|---|
| 949 000701604 | County | 1 | 1 | |
| 949 000701702 | County | 1 | 1 | |
| 949 000701802 | County | 1 | 1 | |
| 949 000701902 | County | 1 | 1 | |
| 949 000702001 | County | 0 | 0 | |
| 949 000702100 | County | 1 | 1 | |
| 949 000702300 | County | 1 | 1 | |
| 949 000702400 | County | 1 | 1 | |
| 949 000702500 | County | 1 | 1 | |
| 949 000702600 | County | 1 | 1 | |
| 949 000800303 | County | 1 | 1 | water & sewer |
| 949 000800306 | County | 0 | 1 | |
| 949 000800400 | County | 1 | 2 | water |
| 949 000800505 | County | 0 | 1 | |
| 949 000800506 | County | 1 | 1 | water |
| 949 000800603 | County | 1 | 1 | water |
| 949 001100101 | County | 1 | 1 | |
| 949 001100102 | County | 1 | 1 | water & sewer |
| 949 001100200 | County | 1 | 2 | water |
| 949 001100300 | County | 1 | 2 | |
| 949 001100403 | County | 1 | 1 | |
| 949 001100406 | County | 0 | 1 | |
| 949 001100408 | County | 1 | 1 | |
| 949 001100410 | County | 1 | 1 | |
| 949 001100411 | County | 1 | 1 | |
| 949 001100412 | County | 1 | 1 | |
| 949 001100500 | County | 1 | 3 | |
| 949 001500105 | County | 1 | 1 | |
| 949 001500106 | County | 1 | 1 | |
| 949 001500107 | County | 1 | 1 | |
| 949 001500108 | County | 1 | 1 | water & sewer |
| 949 001500200 | County | 1 | 3 | |
| 949 001500301 | County | 1 | 1 | |
| 949 001500303 | County | 1 | 1 | |
| 949 001500306 | County | 1 | 1 | |
| 949 001500308 | County | 0 | 1 | |
| 949 001500309 | County | 0 | 0 | |
| 949 001500310 | County | 0 | 1 | |
| 949 001500402 | County | 1 | 1 | |
| 949 001500405 | County | 0 | 0 | |
| 949 001500406 | County | 1 | 1 | |
| 949 001500408 | County | 1 | 1 | |
| 949 001500501 | County | 1 | 1 | water & sewer |
| 949 001500502 | County | 1 | 1 | sewer |
| 949 001500503 | County | 1 | 3 | |
| 949 001500600 | County | 1 | 1 | |
| 949 001500700 | County | 1 | 1 | |
| 949 001600700 | County | 1 | 2 | |
| 949 001600800 | County | 1 | 2 | |
| 949 001800100 | County | 0 | 0 | |
| 949 001800400 | County | 0 | 1 | |
| 949 001800500 | County | 0 | 1 | |
| 949 001800600 | County | 0 | 1 | |
| 949 001800700 | County | 0 | 1 | |
| 949 001800800 | County | 0 | 0 | |
| 949 001800900 | County | 0 | 1 | |
| 949 001801000 | County | 0 | 1 | |
| 949 001801100 | County | 0 | 1 | |
| 949 001801200 | County | 1 | 1 | |
| 949 001900100 | County | 1 | 1 | |
| **Total** | | 92 | 125 | |

# Appendix B: Water System Cost Estimate Detail

**Project:** City of Pleasanton, Happy Valley Water and Sewer Expansion

Date: May 9, 2016
Project Number: 0548-002

**Component:** Water System Expansion

Prepared by: James Kohne, RMC

Estimate Type: Predesign, Class 4, AACE

## Process Cost Summary

| Spec. Division | | | Amount |
|---|---|---|---|
| Facilities | | | $ 2,280,000 |
| | **RAW CONSTRUCTION COST** | | $ 1,520,000 |
| | **Environmental, Legal, and Administrative (ELA) Allowance** | 10% | *$ 150,000* |
| | **Engineering/Construction, Management (CM) Allowance** | 15% | *$ 230,000* |
| | **BASE CONSTRUCTION COST** | | **$ 1,900,000** |
| | **Project Contingency (Uncertainty in project facilities)** | 20% | **$ 380,000** |
| | **FACILITIES FINAL COST** | | **$ 2,280,000** |

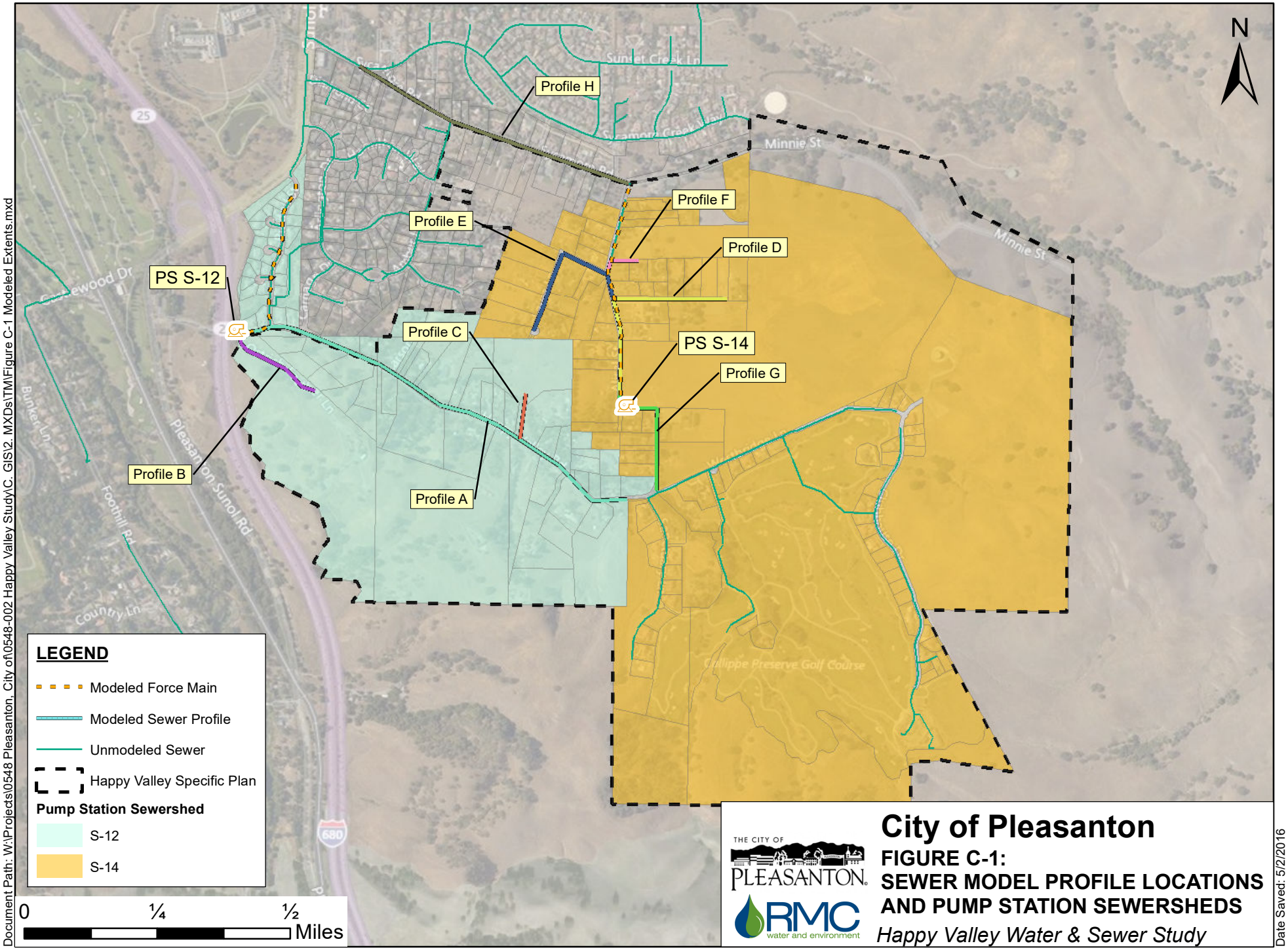
| | Item | Size | Units | Quantity | Unit | Unit Cost | Total Cost |
|---|---|---|---|---|---|---|---|
| **Facilities** | | | | | | | **$ 1,523,555** |
| **Piping** | **8" PVC Pipe** | **8** | **LF** | **7640** | $ | 18 | **$ 138,164** |
| | **6" PVC Pipe** | **6** | **LF** | **1100** | $ | 13 | **$ 14,733** |
| | **Joint Restraints** (on 40% of 20' segments) | | **EA** | **175** | $ | 198 | **$ 34,618** |
| | **Fittings** (1 per 100') | | **EA** | **87** | $ | 1,000 | **$ 87,400** |
| | **Installation** | | **Hr/Fitting** | **87** | $ | 100 | **$ 8,740** |
| | **Sawcut 4" pavement (2x length of pipe)** | | **LF** | **17480** | $ | 4 | **$ 71,216** |
| | **Excavation - Pipe trench, Vault, Weir** | | **CY** | **4230** | $ | 5 | **$ 21,955** |
| *See table below for trenching dimensions. Volumes assume all 8" pipe* | **Pipe Zone Embedment Fill (CY)** (to 1' above crown of pipe) | | **CY** | **2449** | $ | 28 | **$ 67,346** |
| | **Pipe Zone Compaction (CY)** | | **CY** | **2449** | $ | 3 | **$ 7,483** |
| | **Upper Trench Zone (BCY)** (0.75' above pipe zone) | | **BCY** | **1113** | $ | 29 | **$ 32,060** |
| | **Upper Trench Compaction (BCY)** | | **BCY** | **1113** | $ | 1 | **$ 1,591** |
| | **Shoring** | | **LF** | **8740** | $ | 10 | **$ 87,400** |
| | **Hauling (Excess)** (assumes all backfill is engineered) | | **CY** | **4230** | $ | 5 | **$ 22,484** |
| | **Ag Base (BCY)** (top 15" of trench) | | **BCY** | **1113** | $ | 30 | **$ 33,247** |
| | **Trench AC Plug Paving** (trench width x pipe length) | | **SF** | **24039** | $ | 3 | **$ 64,120** |
| | **Grind (SY)** (surface area of streets not excavated) | | **SY** | **9468** | $ | 3 | **$ 28,284** |
| | **AC Overlay (SF)** (surface are of streets) | | **SF** | **109250** | $ | 3 | **$ 333,825** |
| | **Striping** (length of piping) | | **LF** | **8740** | $ | 1 | **$ 10,724** |
| **Hydrants** | **Hydrants** | | **EA** | **21** | $ | 3,283 | **$ 68,950** |
| **PRV Station** | **Pressure Reducing Valve** | **8"** | **EA** | **1** | $ | 12,264 | **$ 12,264** |
| | **Gate Valves** | **8"** | **EA** | **2** | $ | 3,101 | **$ 6,202** |
| | **PRV Vault** | **4'x5'x5'** | **EA** | **1** | $ | 3,751 | **$ 3,751** |
| **Butterfly Valves** | **Butterfly Valve** | **12"** | **EA** | **3** | $ | 1,455 | **$ 4,366** |
| | **Butterfly Valve** | **8"** | **EA** | **8** | $ | 704 | **$ 5,633** |
| | **Butterfly Valve** | **6"** | **EA** | **5** | $ | 613 | **$ 3,067** |
| **Miscellaneous** | **Pot Hole (1 per 50')** | | **EA** | **175** | $ | 509 | **$ 89,020** |
| | **Cathodic** | | **LF** | **8740** | $ | 9 | **$ 81,898** |
| | **Traffic Control** | | **LS** | **8740** | $ | 5 | **$ 44,510** |
| | | | | | | *Subtotal:* | $ 1,385,050 |
| | **Mobilization/Demobilization** | | **% of subtotal** | **10%** | | | **$ 138,505** |

| **Pipe and Trenching Details, 8" pipe** | | |
|---|---|---|
| Pipe Thickness | 0.503 | in |
| OD Pipe | 0.751 | ft |
| Approx Pipe Cover | 3 | ft |
| Trench Width | 2.75 | ft |
| Trench Depth | 4.75 | ft |
| Lane Width | 12.50 | ft |

| | |
|---|---|
| Avg cost per foot | **$ 162** |
| Avg cost per foot, 8" | **$ 163** |
| Avg cost per foot , 6" | **$ 158** |

*Note: Sales tax of 9.5% is applied to appropriate material costs.*

# Appendix C: Modeled Sewer Extent and Gravity Sewer Hydraulic Profiles




# City of Pleasanton

**FIGURE C-1:**
**SEWER MODEL PROFILE LOCATIONS AND PUMP STATION SEWERSHEDS**

*Happy Valley Water & Sewer Study*

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Date Saved: 5/2/2016

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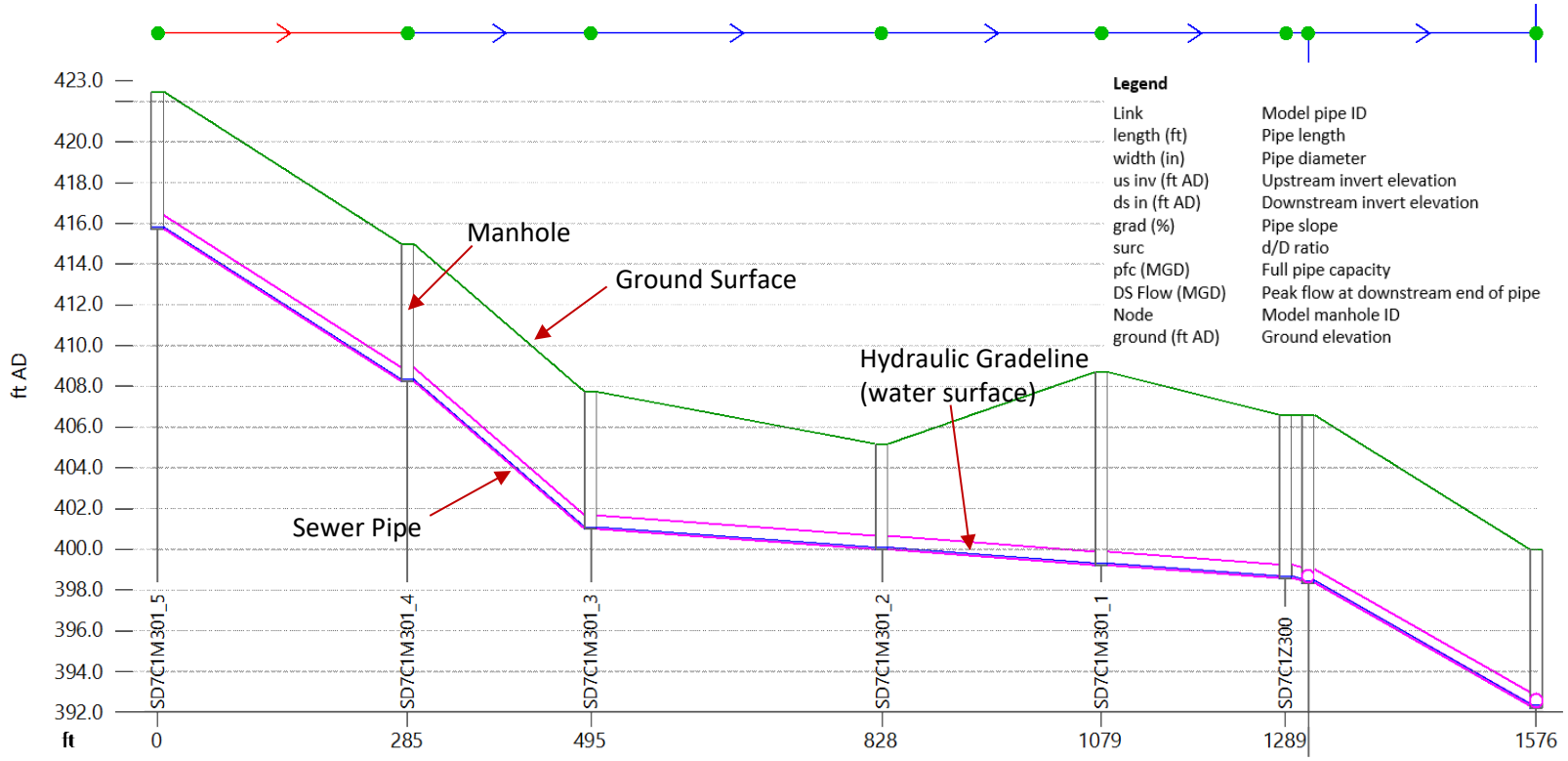
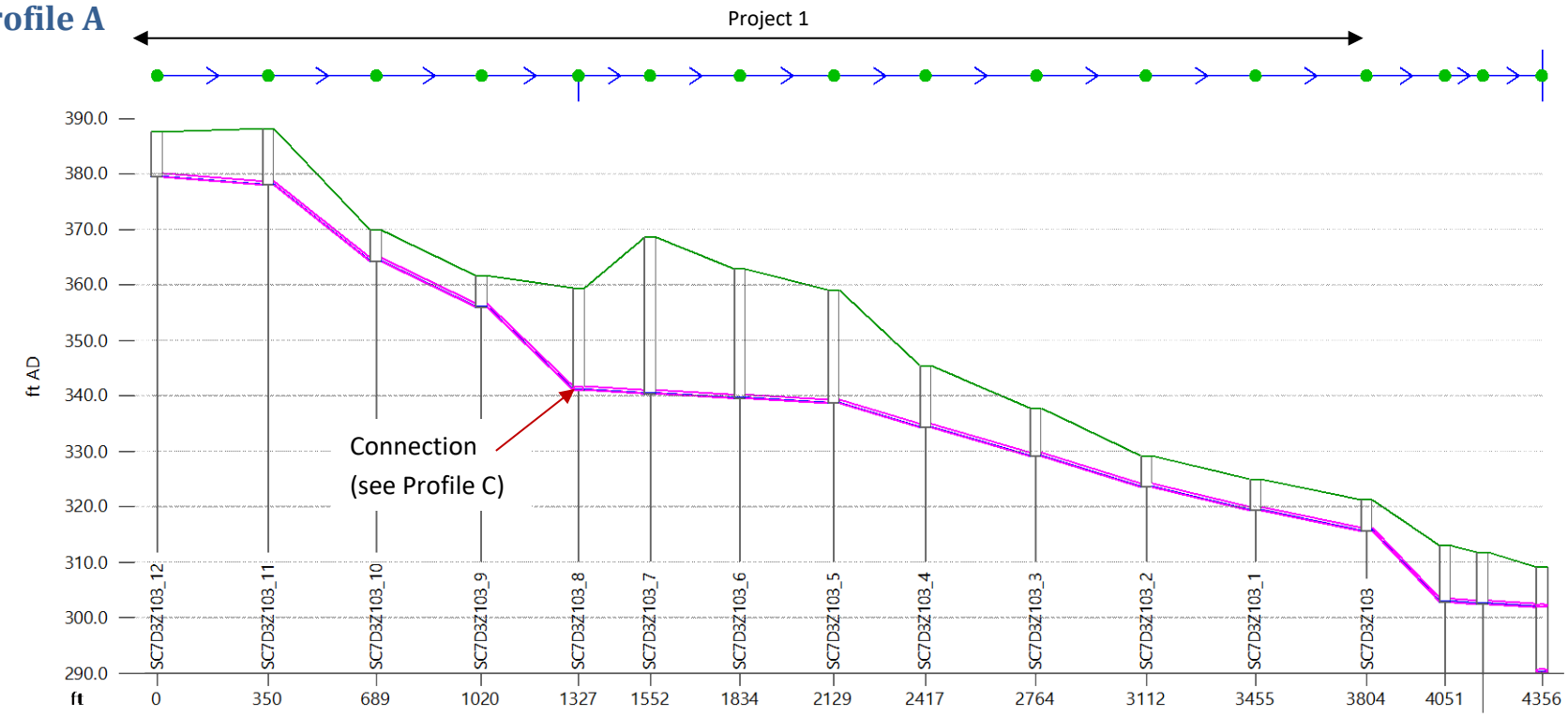
# Profile Legend




| Link | SD7C1M301_5.1 | SD7C1M301_4.1 | SD7C1M301_3.1 | SD7C1M301_2.1 | SD7C1M301_1.1 | - | SD7C1M301.1 |
|---|---|---|---|---|---|---|---|
| length (ft) | 285.5 | 209.8 | 332.5 | 250.8 | 210.6 | - | 260.5 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | 8.0 |
| us inv (ft AD) | 415.730 | 408.261 | 400.999 | 400.002 | 399.222 | - | 398.360 |
| ds inv (ft AD) | 408.261 | 400.999 | 400.002 | 399.222 | 398.590 | - | 392.320 |
| grad (%) | 2.616 | 3.462 | 0.300 | 0.311 | 0.300 | - | 2.319 |
| surc | 0.11 | 0.12 | 0.13 | 0.13 | 0.13 | - | 0.13 |
| r.pfc (MGD) | 1.29 | 1.48 | 0.43 | 0.44 | 0.43 | - | 1.21 |
| DS flow (MGD) | 0.0014 | 0.0035 | 0.0042 | 0.0063 | 0.0077 | - | 0.0189 |

| Node | - | SD7C1M301_4 | SD7C1M301_3 | SD7C1M301_2 | SD7C1M301_1 | - | - | - |
|---|---|---|---|---|---|---|---|---|
| ground (ft AD) | 422.467 | 414.998 | 407.736 | 405.180 | 408.710 | 406.600 | 406.600 | 400.000 |

# Profile A

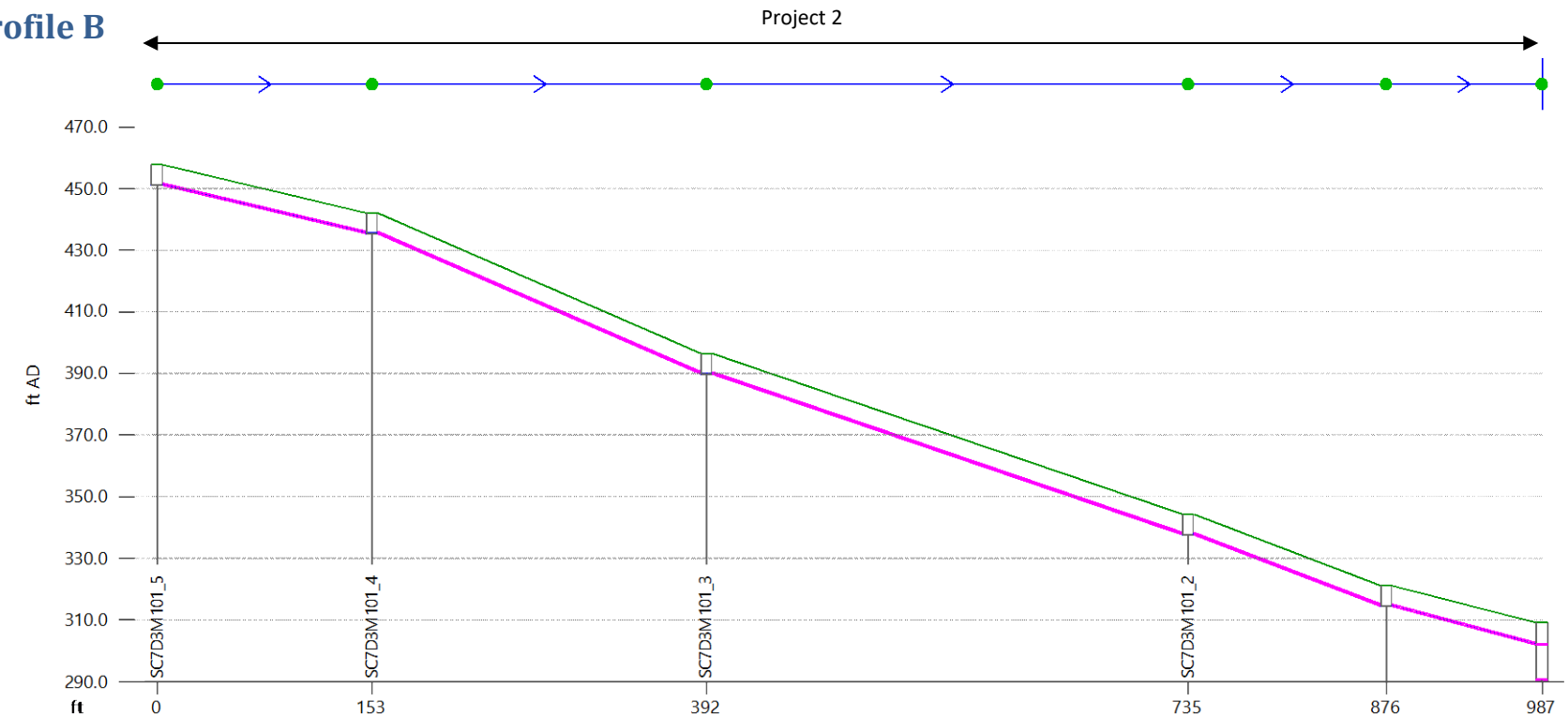



| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Link | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| length (ft) | 350.0 | 339.3 | 331.1 | 306.4 | 224.9 | 282.4 | 294.7 | 288.5 | 346.8 | 347.5 | 343.5 | 349.3 | 246.7 | - | 187.6 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | 379.454 | 378.034 | 364.198 | 356.005 | 341.056 | 340.382 | 339.534 | 338.650 | 334.267 | 329.087 | 323.521 | 319.295 | 315.572 | - | - |
| ds inv (ft AD) | 378.034 | 364.198 | 356.005 | 341.056 | 340.382 | 339.534 | 338.650 | 334.267 | 329.087 | 323.521 | 319.295 | 315.572 | 302.860 | - | - |
| grad (%) | 0.406 | 4.078 | 2.475 | 4.879 | 0.300 | 0.300 | 0.300 | 1.519 | 1.494 | 1.602 | 1.230 | 1.066 | 5.154 | - | 0.293 |
| surc | 0.12 | 0.12 | 0.12 | 0.16 | 0.16 | 0.19 | 0.19 | 0.15 | 0.16 | 0.17 | 0.18 | 0.18 | 0.14 | - | 0.27 |
| r.pfc (MGD) | 0.50 | 1.58 | 1.23 | 1.73 | 0.43 | 0.43 | 0.43 | 0.96 | 0.95 | 0.99 | 0.87 | 0.81 | 1.77 | - | 0.42 |
| DS flow (MGD) | 0.0042 | 0.0063 | 0.0091 | 0.0105 | 0.0168 | 0.0168 | 0.0239 | 0.0246 | 0.0295 | 0.0323 | 0.0358 | 0.0379 | 0.0393 | - | 0.0603 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Node | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| ground (ft AD) | - | 388.201 | 369.865 | 361.672 | 359.446 | - | 362.863 | 359.054 | 345.434 | 337.754 | 329.188 | 324.962 | 321.239 | - | - |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile B

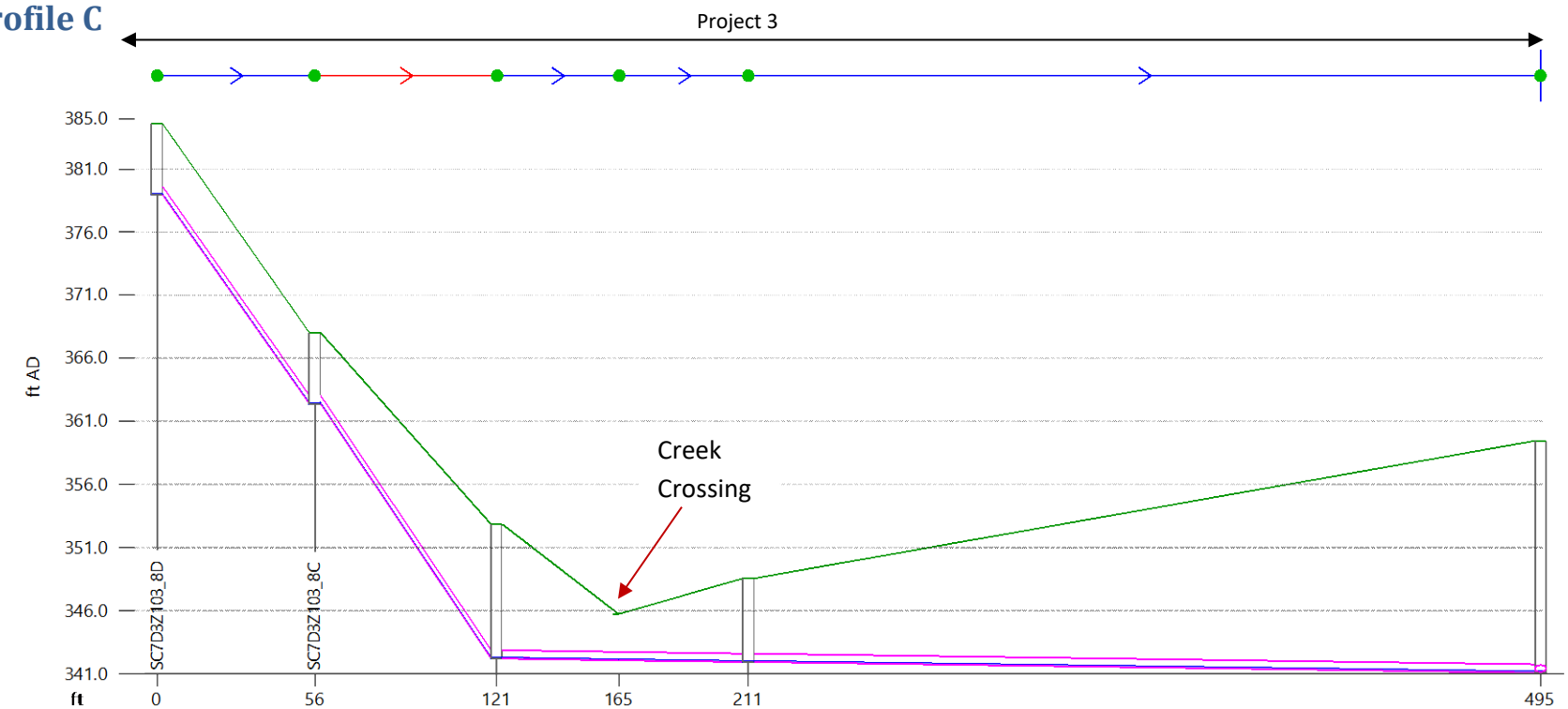



| Link | SC7D3M101_5.1 | SC7D3M101_4.1 | SC7D3M101_3.1 | SC7D3M101_2.1 | SC7D3M101_1.1 |
|---|---|---|---|---|---|
| length (ft) | 153.2 | 238.5 | 343.2 | 141.5 | 110.9 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | 451.093 | 435.411 | 389.820 | 337.666 | 314.415 |
| ds inv (ft AD) | 435.411 | 389.820 | 337.666 | 314.415 | 301.850 |
| grad (%) | 10.233 | 19.114 | 15.197 | 16.434 | 11.335 |
| surc | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| r.pfc (MGD) | 2.50 | 3.42 | 3.05 | 3.17 | 2.63 |
| DS flow (MGD) | 0.0021 | 0.0021 | 0.0028 | 0.0028 | 0.0028 |

| Node | - | SC7D3M101_4 | SC7D3M101_3 | SC7D3M101_2 | SC7D3M101_1 | - |
|---|---|---|---|---|---|---|
| ground (ft AD) | 457.760 | 442.078 | 396.487 | 344.333 | 321.082 | - |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile C

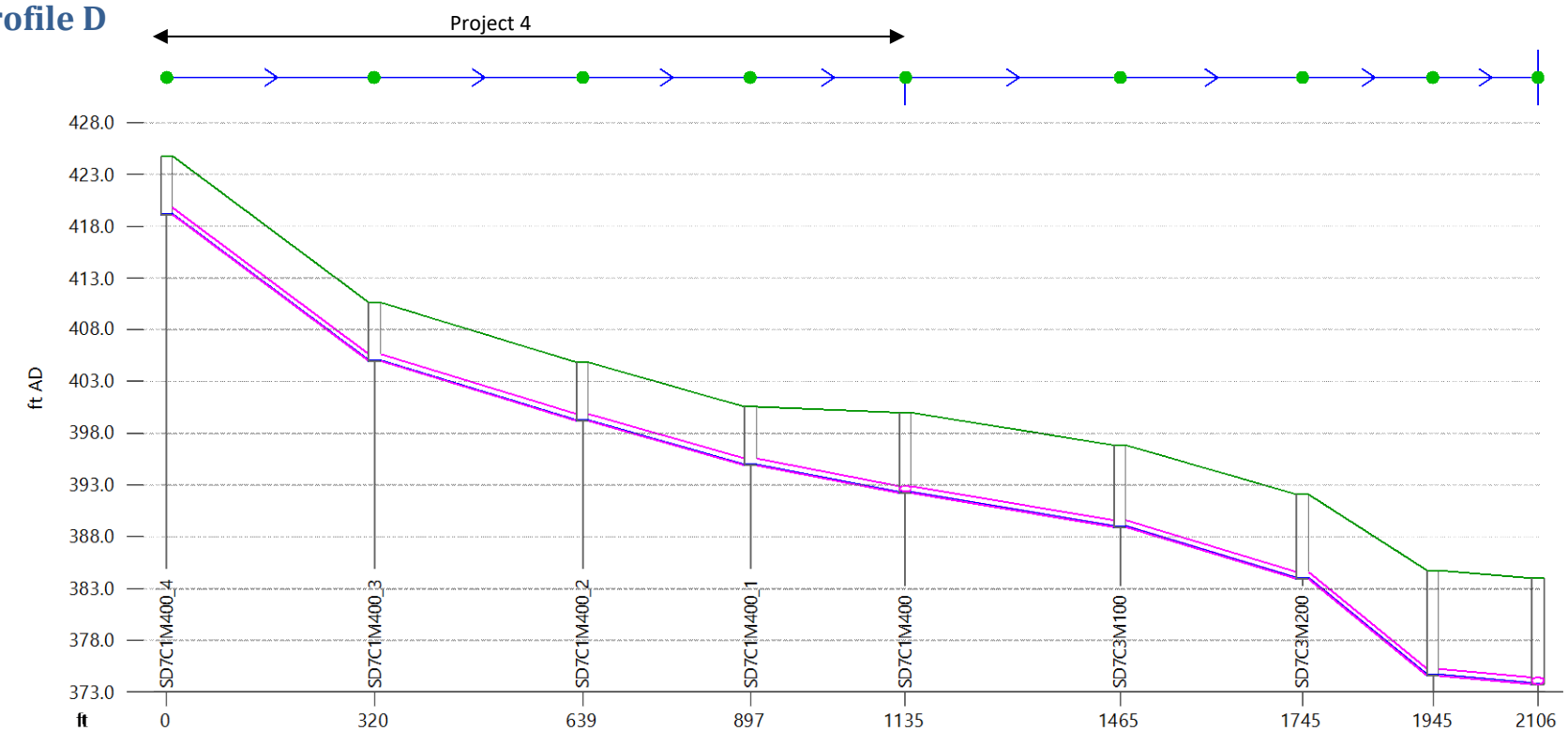



| Link | SC7D3Z103_8D.1 | SC7D3Z103_8C.1 | - | - | SC7D3Z103_8A.1 |
|---|---|---|---|---|---|
| length (ft) | 56.5 | 65.0 | 43.6 | 46.4 | 283.3 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | 378.948 | 362.382 | 342.176 | 342.045 | 341.906 |
| ds inv (ft AD) | 362.382 | 342.176 | 342.045 | 341.906 | 341.056 |
| grad (%) | 29.335 | 31.092 | 0.300 | 0.300 | 0.300 |
| surc | 0.10 | 0.12 | 0.12 | 0.12 | 0.16 |
| r.pfc (MGD) | 4.23 | 4.36 | 0.43 | 0.43 | 0.43 |
| DS flow (MGD) | 0.0035 | 0.0035 | 0.0035 | 0.0035 | 0.0035 |

| Node | - | SC7D3Z103_8C | SC7D3Z103_8B | - | SC7D3Z103_8A | SC7D3Z103_8 |
|---|---|---|---|---|---|---|
| ground (ft AD) | - | 368.049 | 352.840 | 345.712 | 348.543 | 359.446 |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile D

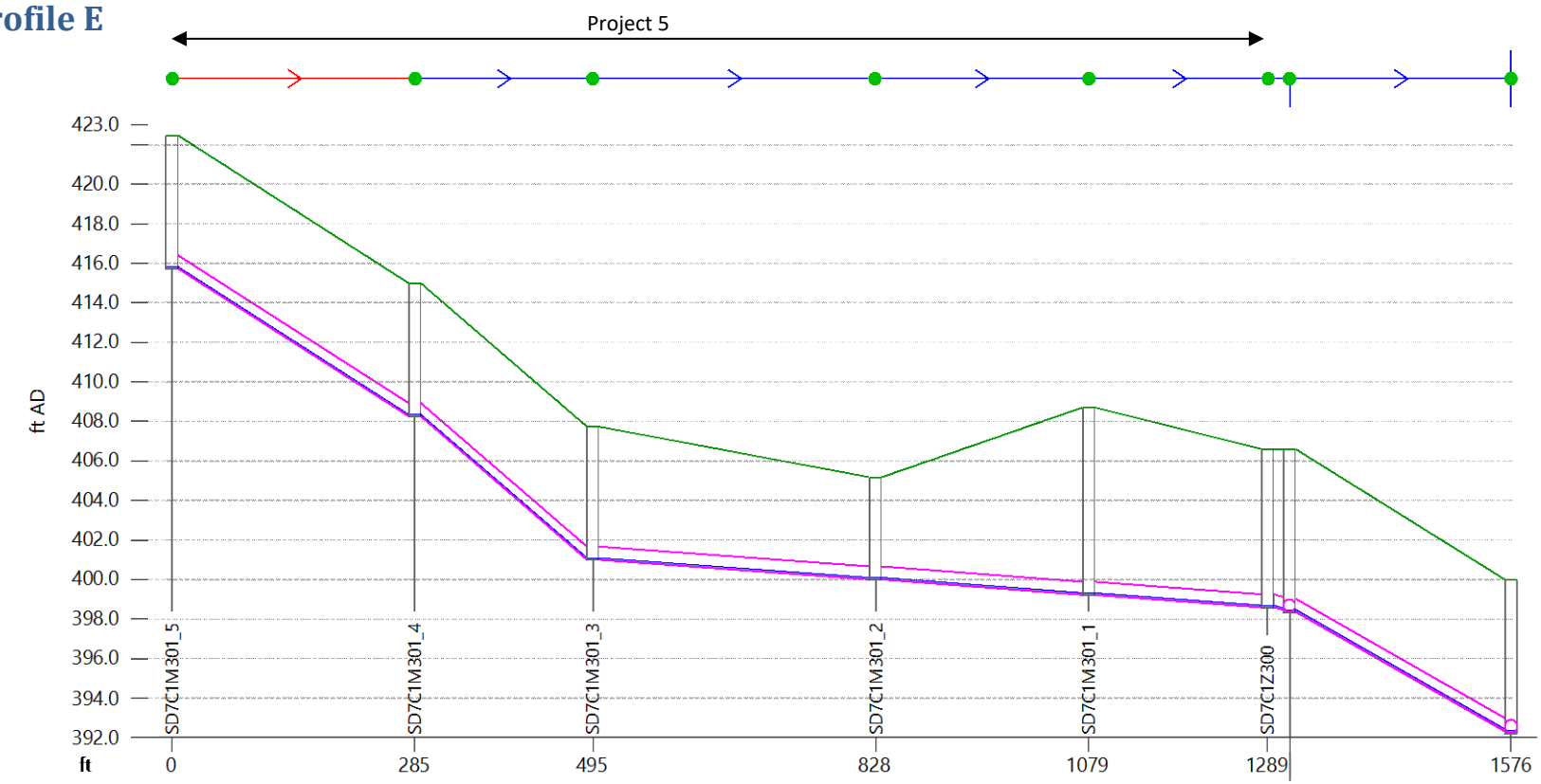



| Link | SD7C1M400_4.1 | SD7C1M400_3.1 | SD7C1M400_2.1 | SD7C1M400_1.1 | SD7C1M400.1 | SD7C3M100.1 | SD7C3M200.1 | - |
|---|---|---|---|---|---|---|---|---|
| length (ft) | 319.8 | 319.3 | 258.1 | 237.5 | 330.2 | 280.0 | 200.4 | 161.0 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | 419.133 | 404.977 | 399.187 | 394.896 | 392.220 | 388.920 | 383.930 | 374.570 |
| ds inv (ft AD) | 404.977 | 399.187 | 394.896 | 392.220 | 388.920 | 383.930 | 374.570 | 373.760 |
| grad (%) | 4.427 | 1.813 | 1.663 | 1.127 | 0.999 | 1.782 | 4.670 | 0.503 |
| surc | 0.11 | 0.12 | 0.12 | 0.16 | 0.16 | 0.15 | 0.19 | 0.19 |
| r.pfc (MGD) | 1.64 | 1.05 | 1.01 | 0.83 | 0.78 | 1.04 | 1.69 | 0.55 |
| DS flow (MGD) | 0.0014 | 0.0056 | 0.0070 | 0.0077 | 0.0280 | 0.0294 | 0.0308 | 0.0308 |

| Node | - | SD7C1M400_3 | SD7C1M400_2 | SD7C1M400_1 | SD7C1M400 | SD7C3M100 | SD7C3M200 | - | - |
|---|---|---|---|---|---|---|---|---|---|
| ground (ft AD) | 424.800 | 410.644 | 404.854 | 400.563 | 400.000 | 396.850 | 392.100 | 384.750 | - |
| flood dep (ft) | -5.599 | -5.592 | -5.590 | -5.586 | -7.674 | -7.830 | -8.079 | -10.055 | - |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile E

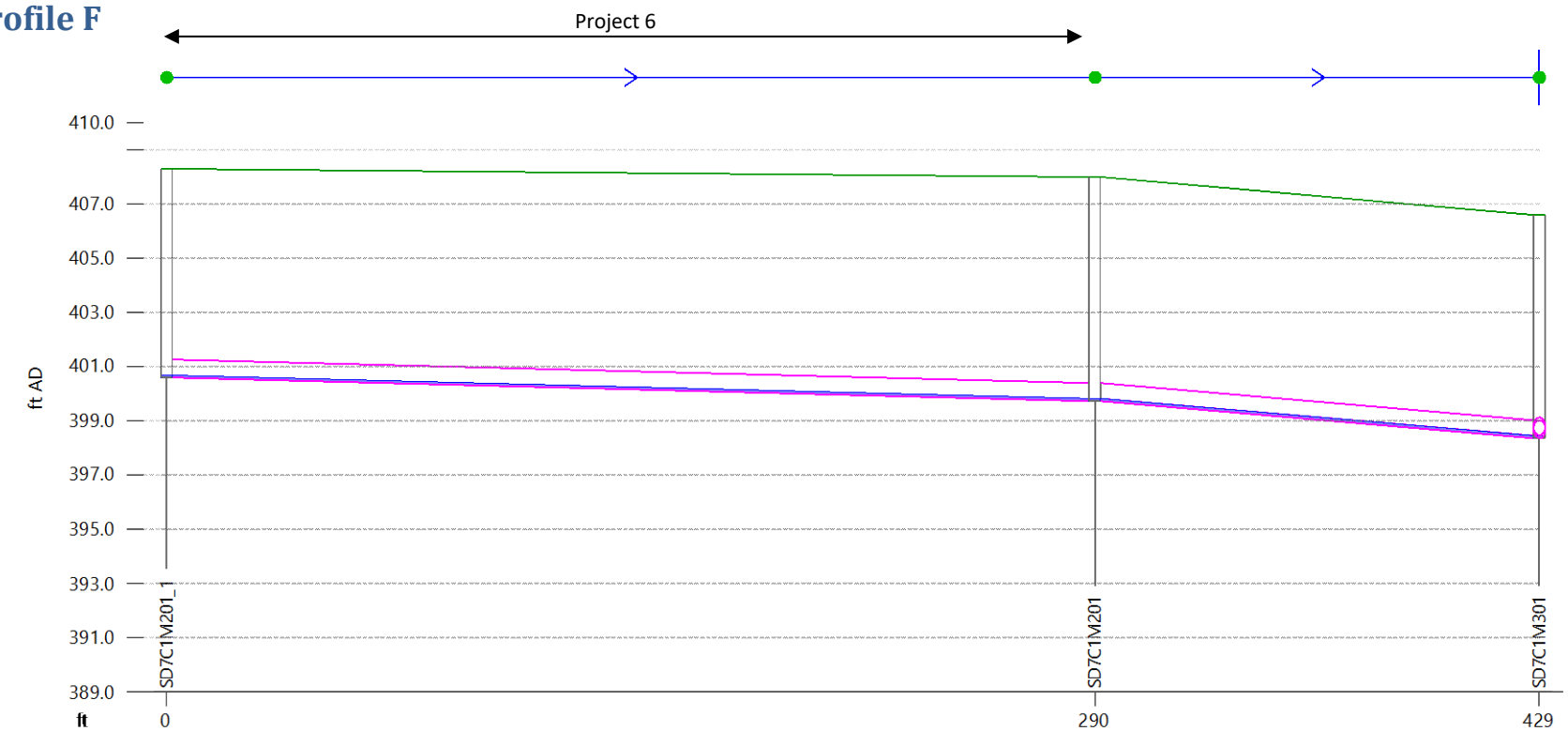



| Link | SD7C1M301_5.1 | SD7C1M301_4.1 | SD7C1M301_3.1 | SD7C1M301_2.1 | SD7C1M301_1.1 | - | SD7C1M301.1 |
|---|---|---|---|---|---|---|---|
| length (ft) | 285.5 | 209.8 | 332.5 | 250.8 | 210.6 | - | 260.5 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | - | 8.0 |
| us inv (ft AD) | 415.730 | 408.261 | 400.999 | 400.002 | 399.222 | - | 398.360 |
| ds inv (ft AD) | 408.261 | 400.999 | 400.002 | 399.222 | 398.590 | - | 392.320 |
| grad (%) | 2.616 | 3.462 | 0.300 | 0.311 | 0.300 | - | 2.319 |
| surc | 0.11 | 0.12 | 0.13 | 0.13 | 0.13 | - | 0.13 |
| r.pfc (MGD) | 1.29 | 1.48 | 0.43 | 0.44 | 0.43 | - | 1.21 |
| DS flow (MGD) | 0.0014 | 0.0035 | 0.0042 | 0.0063 | 0.0077 | - | 0.0189 |

| Node | - | SD7C1M301_4 | SD7C1M301_3 | SD7C1M301_2 | SD7C1M301_1 | - | - | - |
|---|---|---|---|---|---|---|---|---|
| ground (ft AD) | 422.467 | 414.998 | 407.736 | 405.180 | 408.710 | 406.600 | 406.600 | 400.000 |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile F

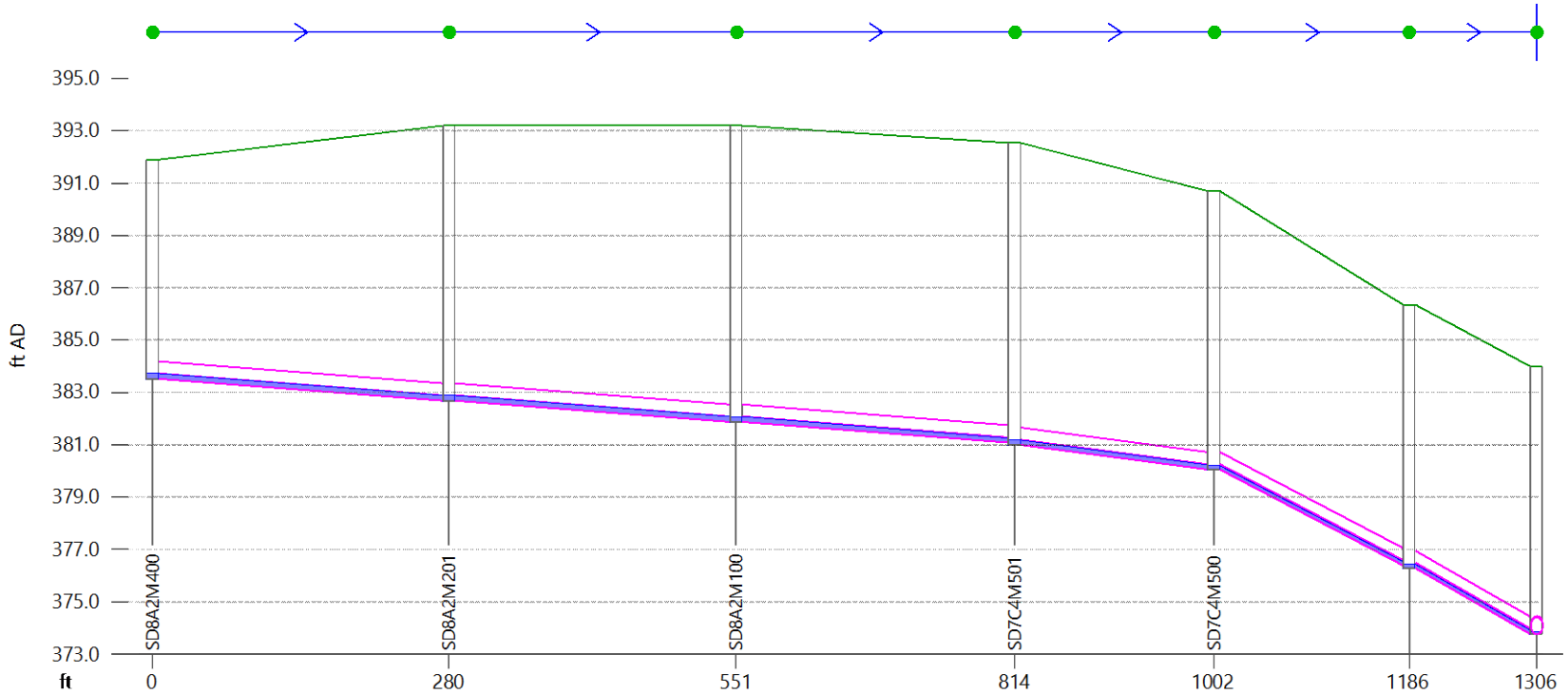



| Link | SD7C1M201_1.1 | SD7C1M201.1 |
|---|---|---|
| length (ft) | 290.5 | 139.0 |
| width (in) | 8.0 | 8.0 |
| us inv (ft AD) | 400.600 | 399.730 |
| ds inv (ft AD) | 399.730 | 398.360 |
| grad (%) | 0.299 | 0.986 |
| surc | 0.13 | 0.13 |
| r.pfc (MGD) | 0.43 | 0.78 |
| DS flow (MGD) | 0.0014 | 0.0098 |

| Node | SD7C1M201_1 | SD7C1M201 | SD7C1M301 |
|---|---|---|---|
| ground (ft AD) | 408.297 | 408.000 | 406.600 |
| flood dep (ft) | -7.626 | -8.186 | -8.152 |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile G

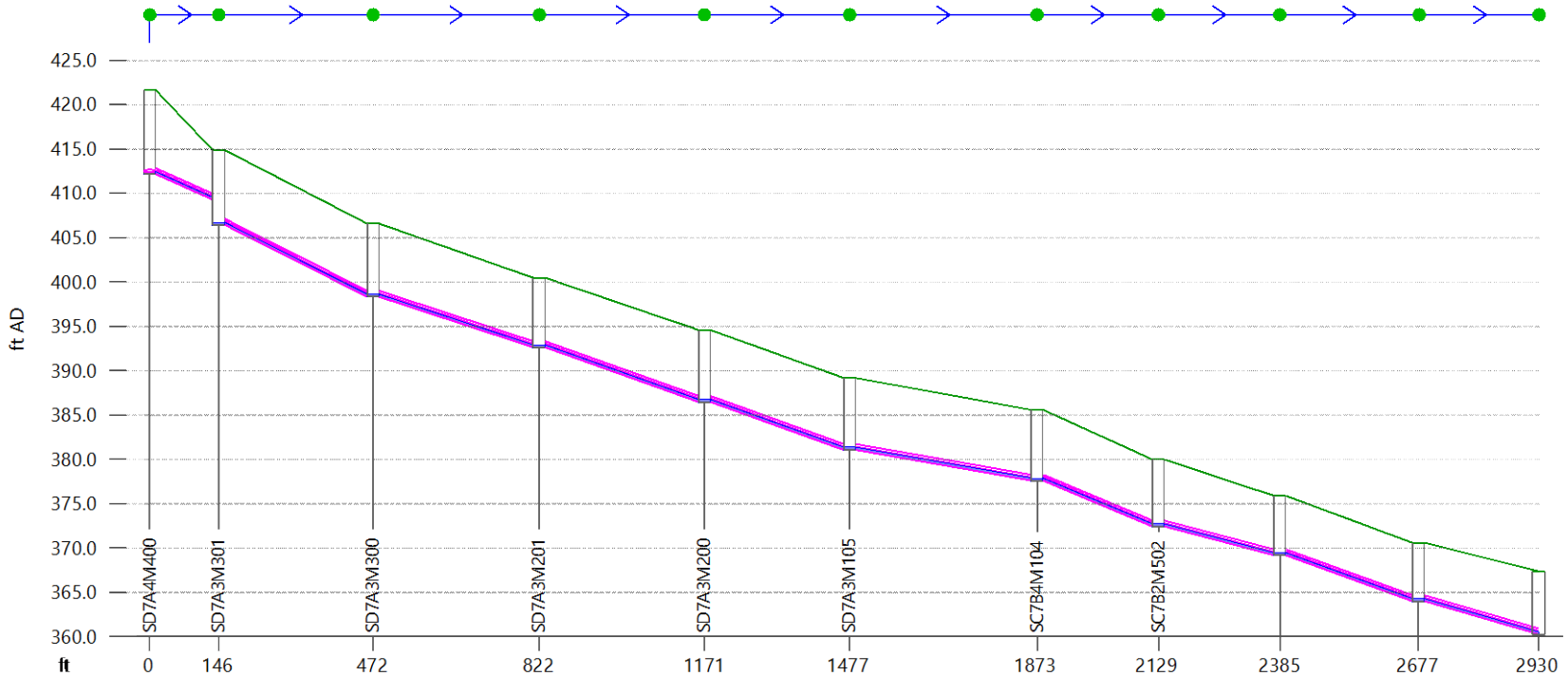



| Link | SD8A2M400.1 | SD8A2M201.1 | SD8A2M100.1 | SD7C4M501.1 | SD7C4M500.1 | - |
|---|---|---|---|---|---|---|
| length (ft) | 280.0 | 271.0 | 263.0 | 188.0 | 184.4 | 120.0 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | 383.520 | 382.680 | 381.870 | 380.990 | 380.050 | 376.280 |
| ds inv (ft AD) | 382.680 | 381.870 | 381.080 | 380.050 | 376.380 | 373.760 |
| grad (%) | 0.300 | 0.299 | 0.300 | 0.500 | 1.990 | 2.100 |
| surc | 0.28 | 0.28 | 0.28 | 0.25 | 0.19 | 0.19 |
| r.pfc (MGD) | 0.43 | 0.43 | 0.43 | 0.56 | 1.12 | 1.15 |
| DS flow (MGD) | 0.0625 | 0.0639 | 0.0667 | 0.0674 | 0.0681 | 0.0709 |

| Node | SD8A2M400 | SD8A2M201 | SD8A2M100 | SD7C4M501 | SD7C4M500 | SD7C3M500 | - |
|---|---|---|---|---|---|---|---|
| ground (ft AD) | 391.900 | 393.200 | 393.200 | 392.540 | 390.700 | 386.350 | - |

Note: All velocities are within velocity criteria defined in Table 4.

## Profile H

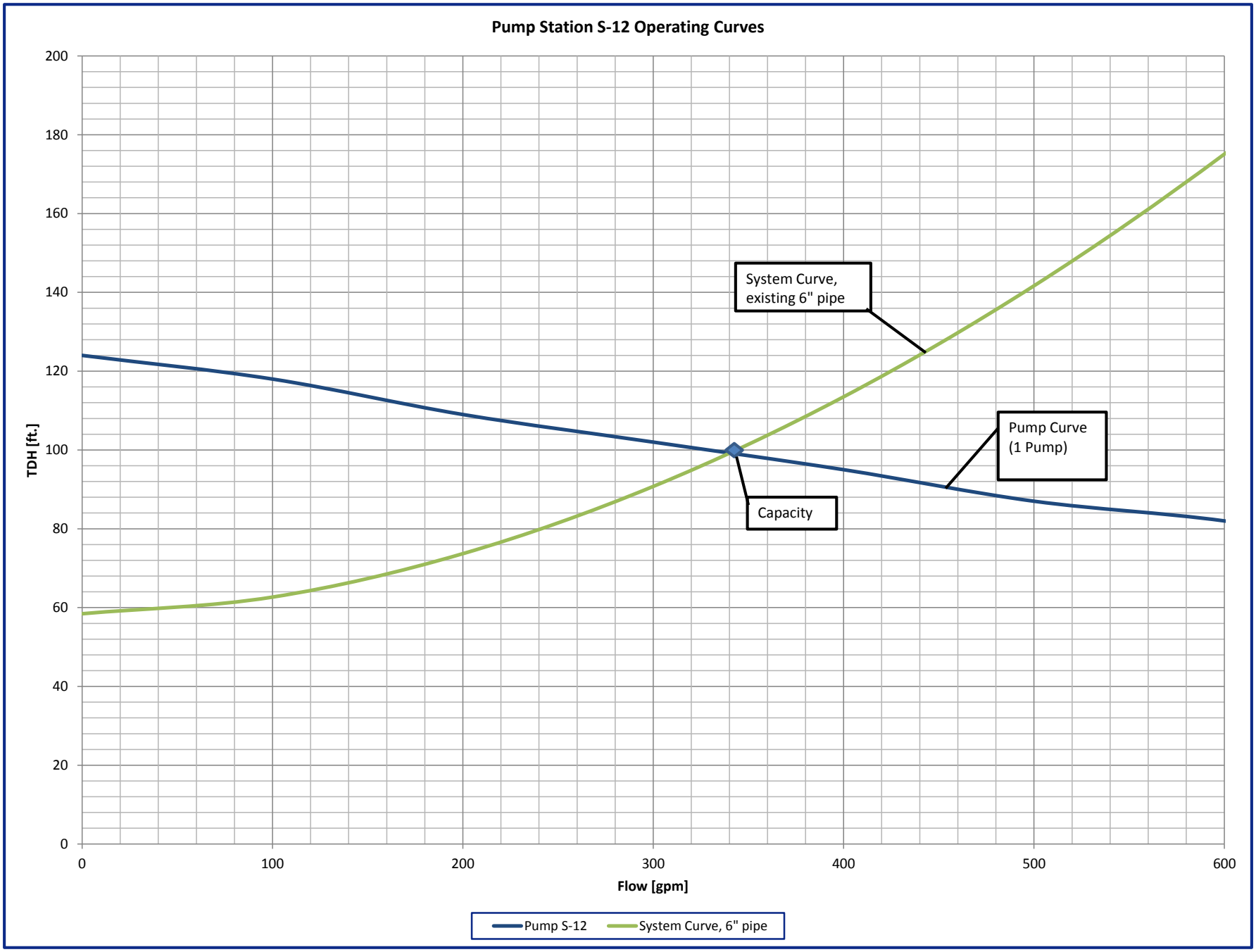


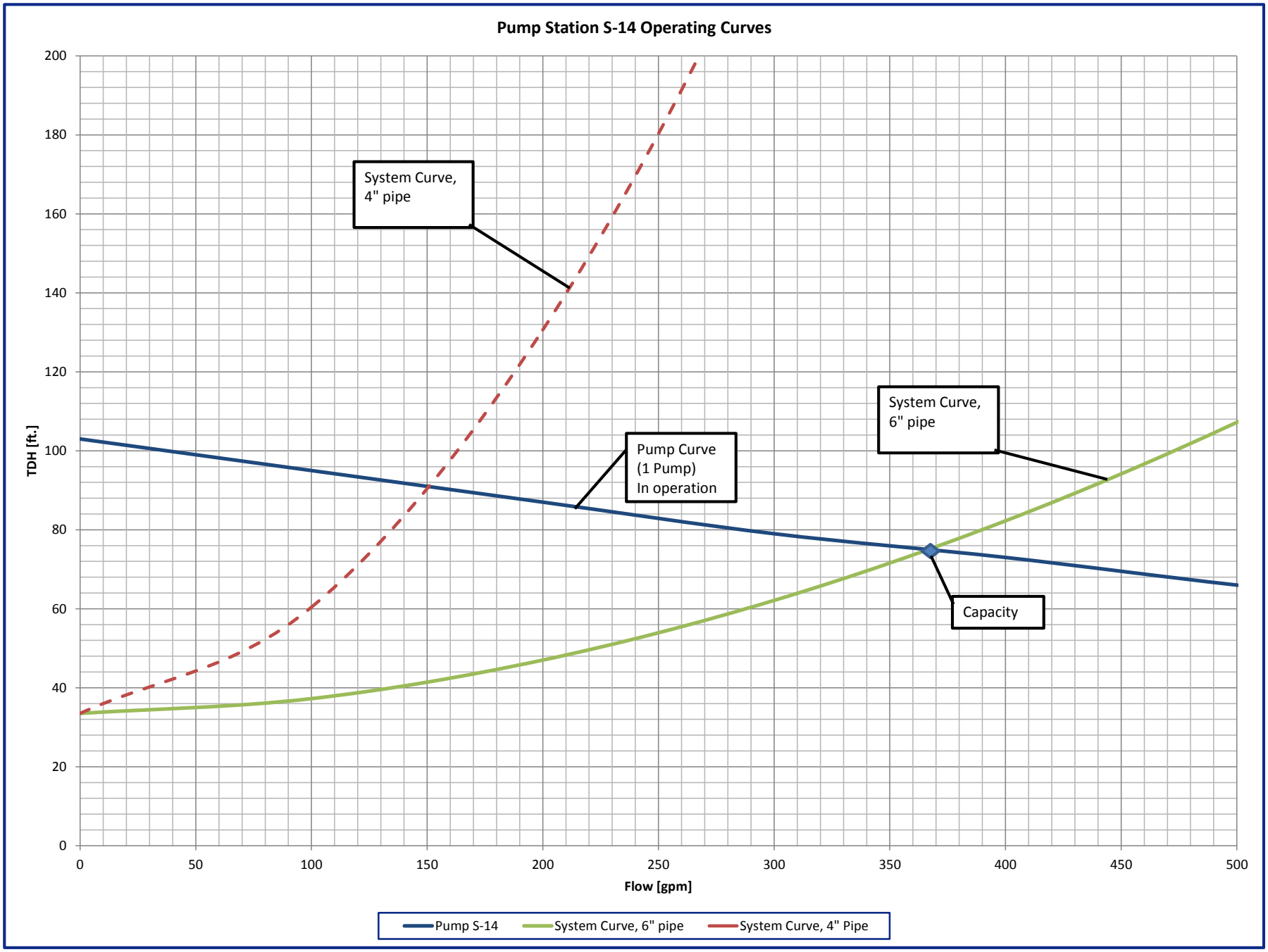

| Link | - | SD7A3M301.1 | SD7A3M300.1 | SD7A3M201.1 | SD7A3M200.1 | SD7A3M105.1 | - | - | SC7B2M402.1 | - |
|---|---|---|---|---|---|---|---|---|---|---|
| length (ft) | 146.0 | 325.9 | 350.2 | 349.1 | 305.7 | 395.6 | 256.0 | 256.4 | 292.3 | 253.0 |
| width (in) | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 | 8.0 |
| us inv (ft AD) | - | 406.470 | 398.350 | 392.650 | 386.480 | 381.070 | 377.610 | 372.430 | 369.180 | 364.000 |
| ds inv (ft AD) | - | 398.350 | 392.650 | 386.480 | 381.070 | 377.610 | 372.430 | 369.180 | 364.000 | 360.260 |
| grad (%) | 1.986 | 2.491 | 1.628 | 1.767 | 1.770 | 0.875 | 2.024 | 1.267 | 1.772 | 1.478 |
| surc | 0.30 | 0.32 | 0.32 | 0.32 | 0.39 | 0.39 | 0.36 | 0.36 | 0.35 | 0.35 |
| r.pfc (MGD) | 1.10 | 1.23 | 1.00 | 1.04 | 1.04 | 0.73 | 1.11 | 0.88 | 1.04 | 0.95 |
| DS flow (MGD) | 0.1991 | 0.2012 | 0.2040 | 0.2082 | 0.2117 | 0.2159 | 0.2180 | 0.2194 | 0.2222 | 0.2257 |

| Node | - | - | SD7A3M300 | SD7A3M201 | SD7A3M200 | SD7A3M105 | SC7B4M104 | - | SC7B2M402 | SC7B2M301 | - |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ground (ft AD) | - | 414.900 | 406.600 | 400.500 | 394.600 | 389.200 | 385.600 | 380.000 | 375.900 | 370.600 | - |
| flood dep (ft) | - | -8.237 | -8.034 | -7.636 | -7.904 | -7.873 | -7.779 | -7.333 | -6.499 | -6.367 | |

Note: All velocities are within velocity criteria defined in Table 4.

# Appendix D: Pump and System Curves


Pump Station S-12 Operating Curves
TDH [ft.]
200
180
160
140
120
100
80
60
40
20
0
0
100
200
300
400
500
600
Flow [gpm]
System Curve, existing 6" pipe
Pump Curve (1 Pump)
Capacity
Pump S-12
System Curve, 6" pipe


Pump Station S-14 Operating Curves
TDH [ft.]
Flow [gpm]
0
20
40
60
80
100
120
140
160
180
200
0
50
100
150
200
250
300
350
400
450
500
System Curve, 4" pipe
Pump Curve (1 Pump) In operation
System Curve, 6" pipe
Capacity
Pump S-14
System Curve, 6" pipe
System Curve, 4" Pipe

# Appendix E: Sewer System Cost Estimate Detail

# Project 1 Happy Valley Road

**PROJECT DESCRIPTION**

Project ID ..... 1
Project Location ..... Happy Valley Road
Description ..... Install approximately 3,800 feet of new 8 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $1,489,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
(iii) Project is deep due to connection at SC7D3Z103_8 (see Project 3)
Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting or dewatering)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SC7D3Z103_12 | SC7D3Z103_11 | 8 | 350 | 0.28 | 9 | Open Cut | $166 | $ 58,100 |
| SC7D3Z103_11 | SC7D3Z103_10 | 8 | 339 | 0.84 | 8 | Open Cut | $166 | $ 56,324 |
| SC7D3Z103_10 | SC7D3Z103_9 | 8 | 331 | 0.10 | 6 | Open Cut | $166 | $ 54,963 |
| SC7D3Z103_9 | SC7D3Z103_8 | 8 | 306 | 0.39 | 12 | Open Cut | $166 | $ 50,862 |
| SC7D3Z103_8 | SC7D3Z103_7 | 8 | 225 | 0.26 | 23 | Open Cut | $400 | $ 89,960 |
| SC7D3Z103_7 | SC7D3Z103_6 | 8 | 282 | 0.003 | 26 | Open Cut | $400 | $ 112,960 |
| SC7D3Z103_6 | SC7D3Z103_5 | 8 | 295 | 0.08 | 22 | Open Cut | $400 | $ 117,880 |
| SC7D3Z103_5 | SC7D3Z103_4 | 8 | 289 | 0.41 | 16 | Open Cut | $196 | $ 56,546 |
| SC7D3Z103_4 | SC7D3Z103_3 | 8 | 347 | 0.24 | 10 | Open Cut | $166 | $ 57,569 |
| SC7D3Z103_3 | SC7D3Z103_2 | 8 | 348 | 0.21 | 7 | Open Cut | $166 | $ 57,685 |
| SC7D3Z103_2 | SC7D3Z103_1 | 8 | 344 | 0.34 | 6 | Open Cut | $166 | $ 57,021 |
| SC7D3Z103_1 | SC7D3Z103 | 8 | 349 | 0.15 | 6 | Open Cut | $166 | $ 57,984 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 827,853 |
| **Baseline Construction Cost:** | **$** | **827,853** |
| Traffic Control (5% of pipe construction cost) | $ | 38,576 |
| **Subtotal:** | **$** | **866,430** |
| Mobilization/Demobilization (10% of subtotal) | $ | 86,643 |
| **Estimated Construction Cost Subtotal:** | **$** | **953,073** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 238,268 |
| **Capital Cost Subtotal** | **$** | **1,191,341** |
| Project Contingency (20%) | $ | 297,835 |
| **Estimated Capital Improvement Cost:** | **$** | **1,489,000** |

# Project 2 Happy Valley Road at Ostrich Feather Lane

**PROJECT DESCRIPTION**

Project ID ..... 2
Project Location ..... Happy Valley Road at Ostrich Feather Lane
Description ..... Install approximately 800 feet of new 8 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $250,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting required)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SC7D3M101_4 | SC7D3M101_3 | 8 | 239 | 0.19 | 7 | Open Cut | $166 | $ 39,591 |
| SC7D3M101_3 | SC7D3M101_2 | 8 | 343 | 0.39 | 7 | Open Cut | $166 | $ 56,971 |
| SC7D3M101_2 | SC7D3M101_1 | 8 | 142 | 0.31 | 7 | Open Cut | $166 | $ 23,489 |
| SC7D3M101_1 | SC7D3M101 | 8 | 111 | 0.11 | 7 | Open Cut | $166 | $ 18,409 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 138,461 |
| **Baseline Construction Cost:** | **$** | **138,461** |
| Traffic Control (5% of pipe construction cost) | $ | 6,923 |
| **Subtotal:** | **$** | **145,384** |
| Mobilization/Demobilization (10% of subtotal) | $ | 14,538 |
| **Estimated Construction Cost Subtotal:** | **$** | **159,922** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 39,980 |
| **Capital Cost Subtotal** | **$** | **199,902** |
| Project Contingency (20%) | $ | 49,976 |
| **Estimated Capital Improvement Cost:** | **$** | **250,000** |

# Project 3 Happy Valley Road about 1,400 feet east of Larson Lane.

**PROJECT DESCRIPTION**

Project ID ..... 3
Project Location ..... Happy Valley Road about 1,400 feet east of Larson Lane.

Description ..... Install approximately 500 feet of new 8 inch PVC pipe
Scenario ..... 2
Estimated Capital Improvement Cost ..... $164,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
(iii) Project serves potential future units in parcel APN 949 000701304
(iv) Deep connection due to creek between SC7D3Z103_7A and SC7D3Z103_7
(v) The vertical location of this project is driven by the elevation of the flowline in an unnamed creek north of Happy Valley Road. During the predesign stage, the flowline of the creek should be surveyed. The results of the survey may alter the proposed elevations of this project and Project 1.
Assumptions ..... (ii) Cost estimates are based on February 2015 ENR CCI of 11178
(ii) Open cut construction assumed across creek

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SC7D3Z103_8D | SC7D3Z103_8C | 8 | 57 | 0.29 | 6 | Open Cut | $166 | $ 9,379 |
| SC7D3Z103_8C | SC7D3Z103_8B | 8 | 65 | 0.31 | 8 | Open Cut | $166 | $ 10,790 |
| SC7D3Z103_8B | SC7D3Z103_8_creek | 8 | 44 | 0.003 | 7 | Open Cut | $166 | $ 7,238 |
| C7D3Z103_8_cree | SC7D3Z103_8A | 8 | 46 | 0.003 | 5 | Open Cut | $166 | $ 7,702 |
| SC7D3Z103_8A | SC7D3Z103_8 | 8 | 283 | 0.003 | 13 | Open Cut | $196 | $ 55,527 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 90,636 |
| **Baseline Construction Cost:** | **$** | **90,636** |
| Traffic Control (5% of pipe construction cost) | $ | 4,532 |
| **Subtotal:** | **$** | **95,168** |
| Mobilization/Demobilization (10% of subtotal) | $ | 10,000 |
| **Estimated Construction Cost Subtotal:** | **$** | **105,168** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 26,292 |
| **Capital Cost Subtotal** | **$** | **131,459** |
| Project Contingency (20%) | $ | 32,865 |
| **Estimated Capital Improvement Cost:** | **$** | **164,000** |

# Project 4 Alisa Street about 260 feet south of E. Mockingbird Ln.

**PROJECT DESCRIPTION**

Project ID ..... 4
Project Location ..... Alisa Street about 260 feet south of E. Mockingbird Ln.
Description ..... Install approximately 1,100 feet of new 8 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $340,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting or dewatering)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SD7C1M400_4 | SD7C1M400_3 | 8 | 320 | 0.26 | 6 | Open Cut | $166 | $ 53,087 |
| SD7C1M400_3 | SD7C1M400_2 | 8 | 319 | 0.04 | 6 | Open Cut | $166 | $ 53,004 |
| SD7C1M400_2 | SD7C1M400_1 | 8 | 258 | 0.20 | 6 | Open Cut | $166 | $ 42,845 |
| SD7C1M400_1 | SD7C1M400 | 8 | 238 | 0.26 | 7 | Open Cut | $166 | $ 39,425 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 188,360 |
| **Baseline Construction Cost:** | **$** | **188,360** |
| Traffic Control (5% of pipe construction cost) | $ | 9,418 |
| **Subtotal:** | **$** | **197,778** |
| Mobilization/Demobilization (10% of subtotal) | $ | 19,778 |
| **Estimated Construction Cost Subtotal:** | **$** | **217,556** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 54,389 |
| **Capital Cost Subtotal** | **$** | **271,945** |
| Project Contingency (20%) | $ | 67,986 |
| **Estimated Capital Improvement Cost:** | **$** | **340,000** |

# Project 5 Laura Lane and E. Mockingbird Ln.

**PROJECT DESCRIPTION**

Project ID ..... 5
Project Location ..... Laura Lane and E. Mockingbird Ln.
Description ..... Install approximately 1,300 feet of new 8 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $669,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting or dewatering)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SD7C1M301_5 | SD7C1M301_4 | 8 | 286 | 0.29 | 7 | Open Cut | $166 | $ 47,393 |
| SD7C1M301_4 | SD7C1M301_3 | 8 | 210 | 0.02 | 7 | Open Cut | $166 | $ 34,827 |
| SD7C1M301_3 | SD7C1M301_2 | 8 | 333 | 0.29 | 6 | Open Cut | $166 | $ 55,195 |
| SD7C1M301_2 | SD7C1M301_1 | 8 | 251 | 0.17 | 7 | Open Cut | $166 | $ 41,633 |
| SD7C1M301_1 | SD7C1Z300 | 8 | 211 | 0.33 | 9 | Open Cut | $166 | $ 34,960 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 214,007 |
| **Baseline Construction Cost:** | **$** | **214,007** |
| Traffic Control (5% of pipe construction cost) | $ | 10,700 |
| **Subtotal:** | **$** | **224,708** |
| Mobilization/Demobilization (10% of subtotal) | $ | 22,471 |
| **Estimated Construction Cost Subtotal:** | **$** | **428,014** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 107,004 |
| **Capital Cost Subtotal** | **$** | **535,018** |
| Project Contingency (20%) | $ | 133,755 |
| **Estimated Capital Improvement Cost:** | **$** | **669,000** |

# Project 6 Byrd Lane

**PROJECT DESCRIPTION**

Project ID ..... 6
Project Location ..... Byrd Lane
Description ..... Install approximately 300 feet of new 8 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $95,000
Comments ..... (i) Pipes are listed in order from upstream to downstream
(ii) Locations of future manholes (and associated pipe segment lengths) are approximate
Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting or dewatering)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SD7C1M201_1 | SD7C1M201 | 8 | 291 | 0.09 | 8 | Open Cut | $166 | $ 48,223 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 48,223 |
| **Baseline Construction Cost:** | **$** | **48,223** |
| Traffic Control (5% of pipe construction cost) | $ | 2,411 |
| **Subtotal:** | **$** | **50,634** |
| Mobilization/Demobilization (10% of subtotal) | $ | 10,000 |
| **Estimated Construction Cost Subtotal:** | **$** | **60,634** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 15,159 |
| **Capital Cost Subtotal** | **$** | **75,793** |
| Project Contingency (20%) | $ | 18,948 |
| **Estimated Capital Improvement Cost:** | **$** | **95,000** |

# Project 7 Alisal Street Force Main

**PROJECT DESCRIPTION**

Project ID ..... 7
Project Location ..... Alisal Street Force Main
Description ..... Install approximately 2,200 feet of new 6 inch PVC pipe
Scenario ..... 1
Estimated Capital Improvement Cost ..... $549,000
Comments ..... (i) Pipes are listed in order from upstream to downstream

Assumptions ..... (i) Cost estimates are based on March 2016 ENR CCI of 11178
(ii) normal open cut construction techniques can be used (no blasting or dewatering)

**PROJECT COST DETAIL**

| U/S MH ID | D/S MH ID | Diameter (inches) | Length (feet) | Slope (%) | Pipe Depth (feet BGL) | Construction Method | Unit Cost ($/LF) | Total Cost ($) |
|---|---|---|---|---|---|---|---|---|
| SD7C3S401 | SD7A4M400 | 6 | 2172 | N/A | N/A | Open Cut | $140 | $ 304,038 |

| | | |
|---|---|---|
| Total Baseline Pipe Construction Cost | $ | 304,038 |
| **Baseline Construction Cost:** | **$** | **304,038** |
| Traffic Control (5% of pipe construction cost) | $ | 15,202 |
| **Subtotal:** | **$** | **319,240** |
| Mobilization/Demobilization (10% of subtotal) | $ | 31,924 |
| **Estimated Construction Cost Subtotal:** | **$** | **351,164** |
| Engineering, Administration, Legal (25% of construction cost) | $ | 87,791 |
| **Capital Cost Subtotal** | **$** | **438,955** |
| Project Contingency (20%) | $ | 109,739 |
| **Estimated Capital Improvement Cost:** | **$** | **549,000** |

# K.2 - Water Distribution System Master Plan Update

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CDM

THE CITY OF PLEASANTON

# Water Distribution System Master Plan Update

November 2004

FINAL REPORT

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# Executive Summary

## Purpose of Study

The purpose of this Water Master Plan Update is to provide a comprehensive water distribution system master plan to identify necessary improvements to the City of Pleasanton's (City's) water system to meet current and future customer needs through buildout. This Master Plan is an update of the City's 1990 Water Master Plan (Carollo, 1991) and the 1988 Hillside Master Plan (Bissell and Karn, 1988). Since that time, the City has experienced significant growth in both the residential and commercial sectors in many geographical areas and pressure zones.

This Master Plan update provides an up-to-date comprehensive look at the overall water system, using recent planning information as well as demand and system information developed using GIS-based data and utility billing system records from the City.

### Water Demands

Camp Dresser & McKee Inc. (CDM) developed demand projections for the City through buildout. The City is currently about 80 percent built out, with full buildout anticipated by 2015. Current average daily water use is 16 mgd. Anticipated buildout average daily water use is 21 mgd.

Future planning within the City of Pleasanton is guided by the City's General Plan, as well as special study areas, such as the Vineyard Corridor and North Sycamore areas, where comprehensive development is planned. The City Planning and Community Development Department maintains detailed statistics on future development of vacant parcels based on information from approved development projects, special study areas, and other planned projects. Future water use projections were developed using information about planned future development provided by the City Planning and Community Development Department.

### Hydraulic Model

CDM developed a hydraulic model of the City's water distribution system for the Water Master Plan Update. The model, which is a detailed representation of the City's system, was first calibrated and verified and then used to assess hydraulic deficiencies within the City's system and identify system improvements necessary to enhance customer service reliability and water quality.

The City has a comprehensive Geographic Information System (GIS) that includes land use planning information, utility infrastructure data and topographic information from recent aerial surveys. The GIS was instrumental in model development, providing extensive up-to-date information.

The project also included a review of available modeling software and purchase of software for the City to use for future evaluations. The $H_2O$Map software was

selected for its graphical capabilities and compatibility with the City's GIS, facilitating future updates of the model.

## Key Findings of the Evaluation

CDM performed hydraulic and water quality evaluations to assess distribution system performance, identify system deficiencies and develop system improvements. The analysis included: hydraulic simulations under peak demand conditions to assess system pressures and the system's ability to supply required fire flows; and, water quality simulations under lower demand conditions to assess the system's ability to maintain high water quality.

In general, CDM found that the City's existing water distribution system has few deficiencies. The evaluation identified three focus areas for which improvements were developed to address hydraulic deficiencies. These areas are:

- Lower zone, where improvements are required to improve reservoir operations, system water quality and reduce hydraulic bottlenecks;
- 770 zone, along the westerly hills and Foothill Road, where improvements are required to meet anticipated in-fill; and,
- Vineyard Corridor Specific Plan area, where improvements are required that can be coordinated with near-term developer-planned improvements for the area.

The evaluation also identified two types of improvements to enhance water quality. These are:

- Bypass valves at pump stations supplying zones with large storage volumes relative to zone demand. These improvements would provide operators more flexibility in managing storage, since operators could open bypass valves, as needed, to draw down zone storage, and then re-fill storage to reduce water age;
- New pipelines to blend the City's wells with water from Zone 7 turnouts prior to introduction into the distribution system. These improvements would be implemented after Zone 7 implements its water quality program to reduce hardness and salts in its delivered water. The proposed pipeline improvements would provide a more uniform water quality, with lower salts and hardness, to the City's customers.

## Planned Improvement Projects

The City's estimated Capital Improvement Program for water system improvements is $19 million, of which approximately $6 million is to meet existing deficiencies and $13 million is for future growth. Figure E-1 and Table E-1 summarize planned improvement projects. Table E-1 includes estimated capital costs for improvements,

as well as phasing of projects.[1] The new pipelines for blending of turnout and well supplies are listed separately with no designated time frame since they are dependent on Zone 7 Water Agency implementing water quality improvements.

Distribution system improvement projects were sized to meet system needs through buildout, anticipated by 2015. CDM prioritized projects based on the timing for which projects are needed (existing or buildout), and the degree to which the system is deficient without planned improvements. Using these criteria, projects were assigned a high, medium or low priority and staged for near-term (2003-2007); mid-term (2008-2011); or long-term (2012-2015). Projects were further prioritized within each time frame to identify which projects are higher and lower priority.

**Table E-1**
**Capital Improvement Program**

| | Priority | Facility | Capacity | Length (ft) | Diam (in) | Cost ($M) | Allocation of Costs ($M) Existing | Allocation of Costs ($M) Future |
|---|---|---|---|---|---|---|---|---|
| **Recommended Improvements for 2003-2007** | | | | | | | | |
| Pipelines | 1 | Tassajara Pipeline | -- | 2,200 | 20 | $ 0.70 | $ 0.25 | $ 0.45 |
| | 2 | Longview Discharge Pipeline | -- | 1,400 | 12 | $ 0.25 | $ 0.11 | $ 0.14 |
| Pump Stations | 1 | Vineyard Corridor (TO#6)(2) | 1.8 mgd | | | $ 0.54 | $ - | $ 0.54 |
| | 2 | McCloud Pump Station | 1.8 mgd | | | $ 0.52 | $ 0.52 | $ - |
| Storage | 1 | 770-2 | 0.6 MG | | | $ 0.90 | $ 0.56 | $ 0.34 |
| | 1 | Vineyard Hills | 1.4 MG | | | $ 1.45 | $ 0.13 | $ 1.32 |
| Valves | 1 | Tassajara Throttling Valve | | | 16 | $ 0.27 | $ 0.10 | $ 0.17 |
| | 2 | North Sycamore PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| Turnouts | 1 | Pimlico Drive Turnout | 5000 gpm | | | $ 0.50 | $ 0.18 | $ 0.32 |
| **Subtotal 2003-2007** | | | | | | **$ 5.23** | **$ 1.93** | **$ 3.30** |
| **Recommended Improvements for 2008-2011** | | | | | | | | |
| Pipelines | 1 | Oak Tree Farm Road | -- | 300 | 10 | $ 0.05 | $ - | $ 0.05 |
| | 2 | TO#3 to Pimlico Turnout | -- | 1,800 | 20 | $ 0.58 | $ 0.21 | $ 0.37 |
| | 1 | Winery Line from Turnout #6 | -- | 3,600 | 16 | $ 0.79 | $ - | $ 0.79 |
| | 1 | Stoneridge | -- | 3,400 | 16 | $ 0.75 | $ - | $ 0.75 |
| | 2 | From TO#5 to Stanley Dr. | -- | 3,000 | 16 | $ 0.66 | $ - | $ 0.66 |
| | 2 | Kamp Drive | -- | 100 | 16 | $ 0.02 | $ 0.02 | $ - |

[1] Master Plan Improvements are for the Master Plan Study Area, which excludes the rural ridgeland areas in Kilkare Canyon and Santos Ranch. No significant growth is planned in these areas and the City budgets for CIP projects separately for these areas.

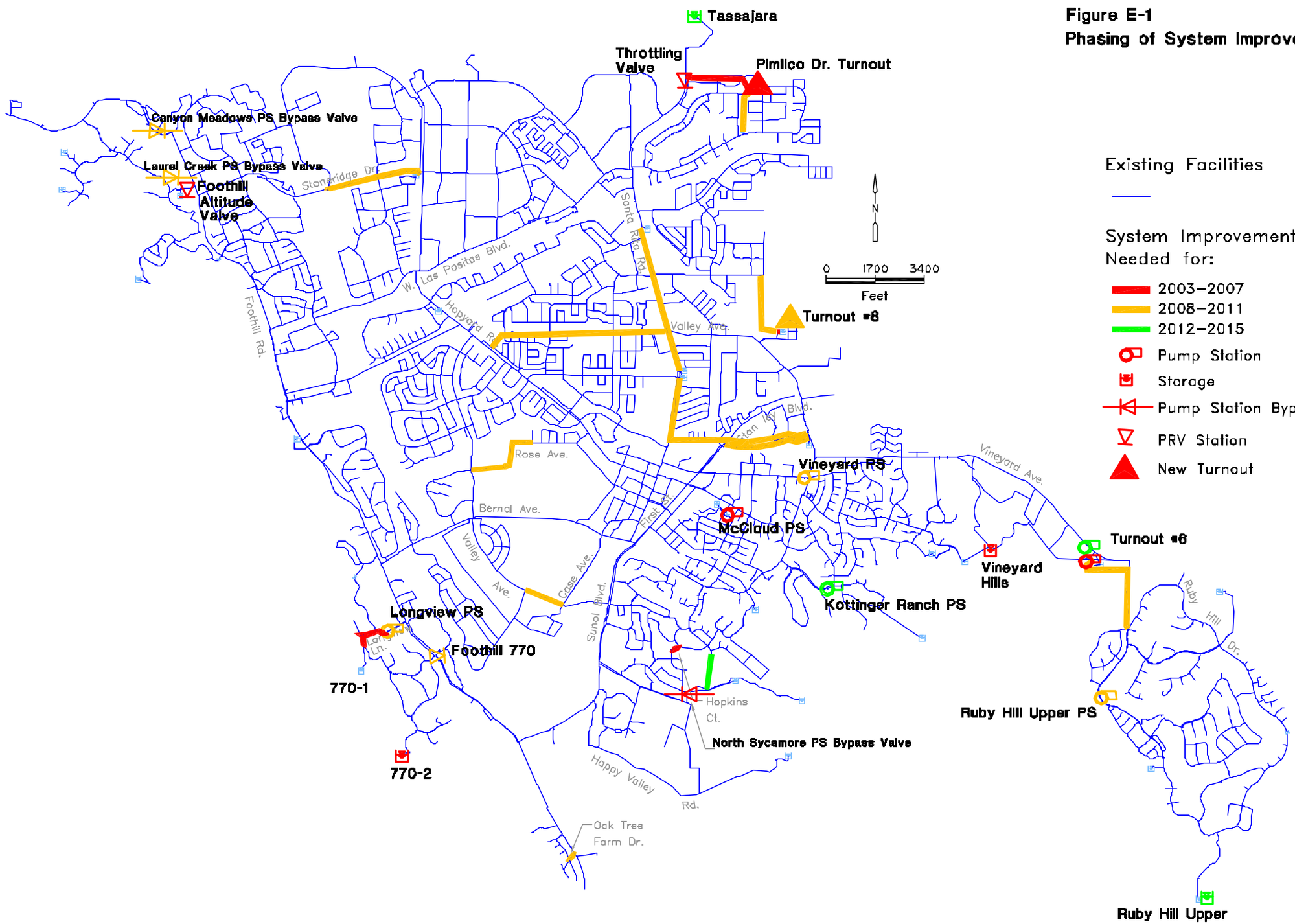
**Table E-1**
**Capital Improvement Program**

| | Priority | Facility | Capacity | Length (ft) | Diam (in) | Cost ($M) | Allocation of Costs ($M) Existing | Allocation of Costs ($M) Future |
|---|---|---|---|---|---|---|---|---|
| Pump Stations | 2 | Vineyard Pump Station | 1.2 mgd | | | $ 0.84 | $ - | $ 0.84 |
| | 2 | Longview Pump Station | 0.7 mgd | | | $ 0.75 | $ - | $ 0.75 |
| | 1 | Upper Ruby Hill Pump Station | 1.2 mgd | | | $ 0.76 | $ - | $ 0.76 |
| Valves | 2 | Foothill 770 PRV | | | 4 | $ 0.03 | $ - | $ 0.03 |
| | 2 | Laurel Creek PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| | 2 | Canyon Meadows PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| **Subtotal 2008-2011** | | | | | | **$ 5.43** | **$ 0.39** | **$ 5.04** |
| **Recommended Improvements for 2012-2015** | | | | | | | | |
| Pipelines | 1 | Independence Dr. | | 1,100 | 12 | $ 0.20 | $ - | $ 0.20 |
| | 2 | Rose Dr. | | 2,800 | 16 | $ 0.62 | $ - | $ 0.62 |
| | 2 | Bernal Ave betw. Valley Ave & Pleasanton Ave | | 2,800 | 16 | $ 0.62 | $ - | $ 0.62 |
| | 1 | Valley Ave betw. Laguna Crk Ln and Case Ave | | 1,400 | 16 | $ 0.31 | $ - | $ 0.31 |
| | 2 | Hopkins Court | | 300 | 12 | $ 0.05 | $ - | $ 0.05 |
| Storage | 1 | Ruby Hill | 0.5 MG | | | $ 0.80 | | $ 0.80 |
| PS | 1 | Vineyard Corridor (TO#6)(2) | 2.5 mgd | | | $ 0.41 | $ - | $ 0.41 |
| | 2 | Kottinger Ranch | 0.3 mgd | | | $ 0.21 | $ - | $ 0.21 |
| **Subtotal 2012-2015** | | | | | | **$ 3.22** | **$ -** | **$ 3.22** |
| **Water Quality Blending Improvements - No Assigned Timeframe (1)** | | | | | | | | |
| Pipelines | 2 | TO # 5 to Well # 6 | -- | 7,400 | 16 | $ 1.63 | $ 1.30 | $ 0.33 |
| | 2 | TO # 1 to Well # 5 | -- | 5,300 | 16 | $ 1.17 | $ 0.94 | $ 0.23 |
| | 2 | Valley Avenue | -- | 5,900 | 16 | $ 1.30 | $ 1.04 | $ 0.26 |
| | 2 | Well # 8 to Mohr Avenue | -- | 2,000 | 16 | $ 0.44 | $ 0.35 | $ 0.09 |
| Turnouts | 1 | Turnout # 8 near Well # 8 | 5000 gpm | | | $ 0.50 | $ 0.40 | $ 0.10 |
| **Subtotal – WQ Blending Improvements** | | | | | | **$ 5.04** | **$ 4.03** | **$ 1.01** |
| **TOTALS** | | | | | | **$ 18.92** | **$ 6.35** | **$ 12.57** |

(1) These improvements are not assigned a time frame since they are dependent on implementation of Zone 7 water quality improvements to reduce hardness and salts in its delivered water.

(2) Includes firm pumping capacity required to meet zone demands plus 1.2 mgd of capacity relocated from Ruby Hill PS to Vineyard Corridor (TO #6) PS. This relocation is required to provide for new pumping capacity at Ruby Hill PS for Upper Ruby Hill pressure zone, while maintaining the same total number of pumps, due to pump station space constraints.

**Figure E-1**
**Phasing of System Improvements**



# Section 1
# Introduction

## 1.1 Study Purpose

The purpose of this Water Master Plan Update is to provide a comprehensive water distribution system master plan to identify necessary improvements to the City of Pleasanton's water system to meet current and future customer needs through buildout. This Master Plan is an update of the City's 1990 Water Master Plan (Carollo, 1991) and the 1988 Hillside Master Plan (Bissell and Karn, 1988). Since that time, the City has experienced significant growth in both the residential and commercial sectors in many geographical areas and pressure zones.

This Master Plan update provides an up-to-date comprehensive look at the overall water system, using recent planning information as well as demand and system information developed using GIS-based data, and recent utility billing data developed by the City.

## 1.2 Scope of Services

The City of Pleasanton retained CDM to prepare the Water Master Plan Update. The scope of work included the following major elements:

- **Develop Water Demand Projections.** CDM developed water demand projections for the City through buildout, anticipated to be about 2015. CDM used the City of Pleasanton's GIS and water customer billing database to establish locations of existing water use. Then, water use projections were developed using detailed planning information for future development, along with historic water use information by customer class, to establish usage for future development.

- **Develop Hydraulic Model.** CDM developed a hydraulic model of Pleasanton's water distribution system using facility information from the City's GIS database and facilities guides, elevation information from an aerial survey flown in 2001, and demand information from the City's water customer billing database. Following model calibration and verification, CDM integrated Zone 7's transmission system model from the Zone 7 Treated Water Master Plan.

- **Identify Water System Improvements.** CDM, in consultation with the City, established system performance criteria and evaluated the existing distribution system with both hydraulic and water quality evaluations to identify deficiencies for existing and buildout conditions. CDM then identified improvements needed to correct the identified distribution system hydraulic and water quality deficiencies.

- **Develop Long Range Capital Improvement Program.** CDM prepared a Capital Improvement Program of staged, recommended improvements, including

planning-level cost estimates, and additional information for establishing connection fees for future customers.

- **Evaluate Renewal and Replacement Program Criteria.** CDM reviewed current criteria used by the City to determine renewal and replacement costs and recommended additional criteria to consider, based on a review of San Francisco Bay Area utilities and available American Water Works Association (AWWA) literature.

- **Prepare Master Plan Report.** This master plan report was prepared to summarize and document the work developed during the master planning effort.

## 1.3 Acronyms and Abbreviations

The following abbreviations and acronyms are used in this report.

| | |
|---|---|
| ACP | Asbestos Cement Pipe |
| APN | Assessor's Parcel Number |
| CDM | Camp Dresser & McKee Inc. |
| CIP | Capital Improvement Program |
| City | City of Pleasanton |
| EPS | Extended Period Simulation |
| $ft^2$ | square-feet |
| GIS | Geographic Information System |
| gpd | gallons per day |
| gpm | gallons per minute |
| HGL | Hydraulic Grade Line |
| HP | horsepower |
| mg | million gallons |
| mg/l | milligrams per liter |
| mgd | million gallons per day |
| PRV | pressure reducing valve |
| PS | pump station |
| psi | pounds per square inch |
| PVC | polyvinyl chloride |
| SCADA | Supervisory Control And Data Acquisition |
| Zone 7 | Zone 7 Water Agency |

## 1.4 Acknowledgements

This report would not have been possible without the valuable assistance of City of Pleasanton Department of Public Works staff, especially Steve Cusenza, Utility Planning Manager and Abbas Masjedi, Utility Engineer.

CDM would also like to acknowledge: Jeff Ballou, Dan Martin, Mark Messa and Daniel Smith, from Department of Public Works – Utilities Division; Steve Wood, Rusty Wynn, and William Wong, Department of General Services - IS/GIS Division;

Eric Carlson, Livermore-Pleasanton Fire Department; and, Heidi Kline, Planning Department. Each provided insight and input to the Master Plan at key points in the plan development.

The CDM team includes the following members:

| | |
|---|---|
| Project Manager | Polly Boissevain |
| Project Engineer | Youssif Hussein |
| Technical Staff | Mary Cousins, Roger Fry, Lisa House, Craig Von Bargen |
| Support Staff | Cheryl Collins, Hank Evans, Julie Hinchcliff |

# Section 2
# Study Area Overview

This section provides an overview of the Water Master Plan study area.

## 2.1 City Service Area

The City of Pleasanton is located in the western part of the Livermore-Amador valley, and abuts the Pleasanton Ridge. The City is bounded by Interstate 580 on the north, Isabel Avenue on the east, Highway 84 on the south, and Pleasanton Ridge to the west. The City provides water service to incorporated areas within the City limits, as well as unincorporated areas surrounding the City in Kilkare Canyon and in the northern part of the Sunol Valley. The service area includes eighteen pressure zones, ranging from about 300 feet to about 1500 feet in elevation. Fourteen of these pressure zones are within the study area.

The Water Master Plan study area includes the portion of the water system within the current City limits and adjacent areas that will be annexed as development takes place. Unincorporated areas were not evaluated for facility needs, but were included in the analysis as demands represented in the areas from which they are supplied. Figure 2-1 shows the Water Master Plan current service area and study area.

## 2.2 Population, Land Use and Water Use

The population of Pleasanton reported in the 2000 census was 63,654. The City also includes a large commercial base, anchored by large commercial areas, such as the Hacienda Business Park. The City includes over 3,400 businesses and industries, employing over 32,000 people. Pleasanton is about 80 percent built out, with full buildout estimated by about 2015.

Figure 2-2 summarizes existing and future land uses within the City of Pleasanton. Existing land use designations shown on Figure 2-2 are based on generalized land use information maintained in the City's water system customer billing database. Each record in the customer billing database lists the class of service being metered, whether it be single-family residential, multi-family residential, commercial, or irrigation. Future land use classifications were provided by the City of Pleasanton Planning Department, based on the latest planning information from a variety of sources, including the General Plan, specific plans for special planning areas, such as the Vineyard Corridor area, and development plans for specific developments.

Current average daily water use within the City is about 16 million gallons per day (mgd). The customer billing database reveals important trends about how and where water is used in the City. Table 2-1 lists the percentage of existing demand used in each pressure zone and shows the distribution of customer classes.

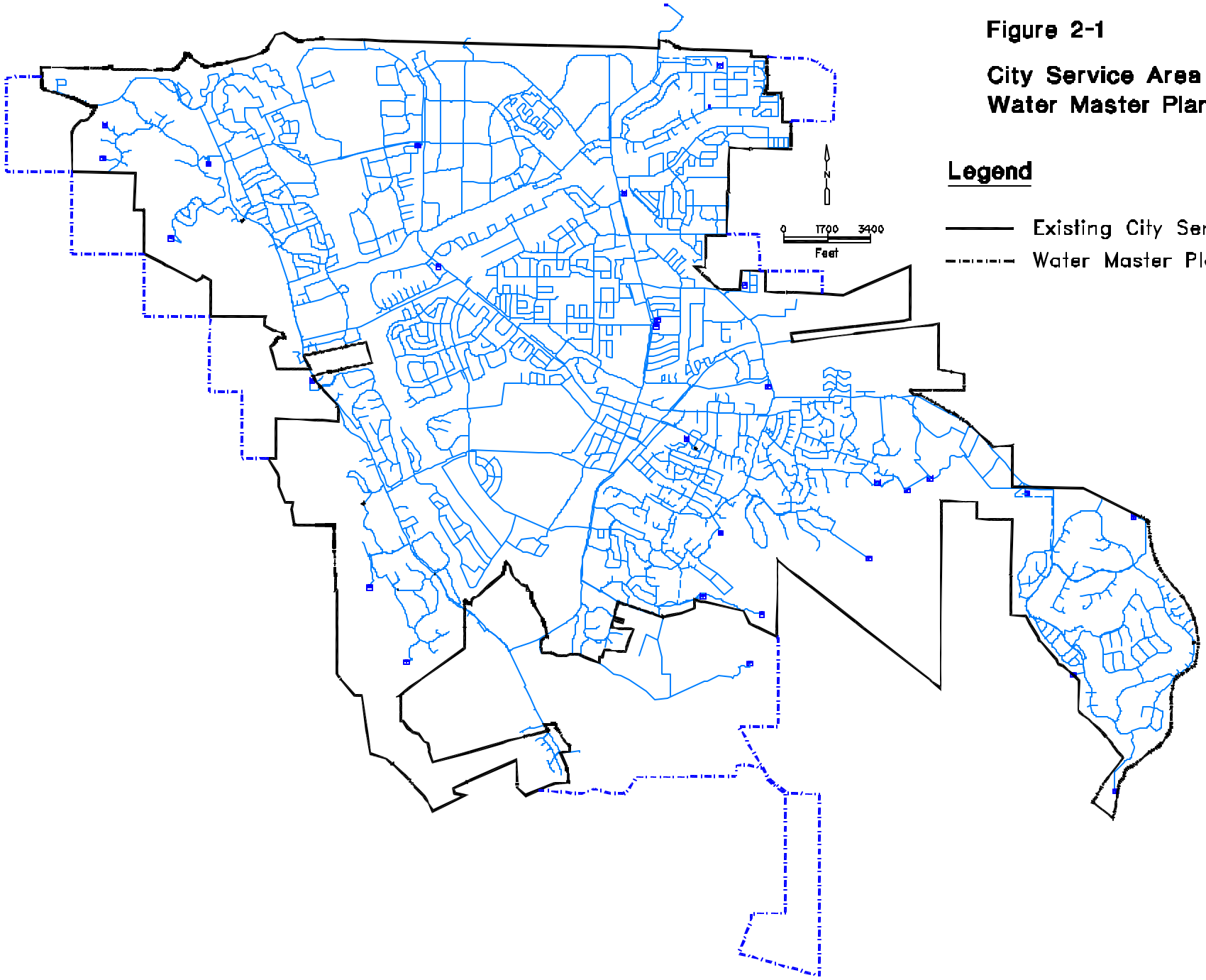



**Figure 2-1**

**City Service Area and Water Master Plan Study Area**

**Legend**

Existing City Service Area

Water Master Plan Study Area

Figure 2-2
Existing and Future Land Use

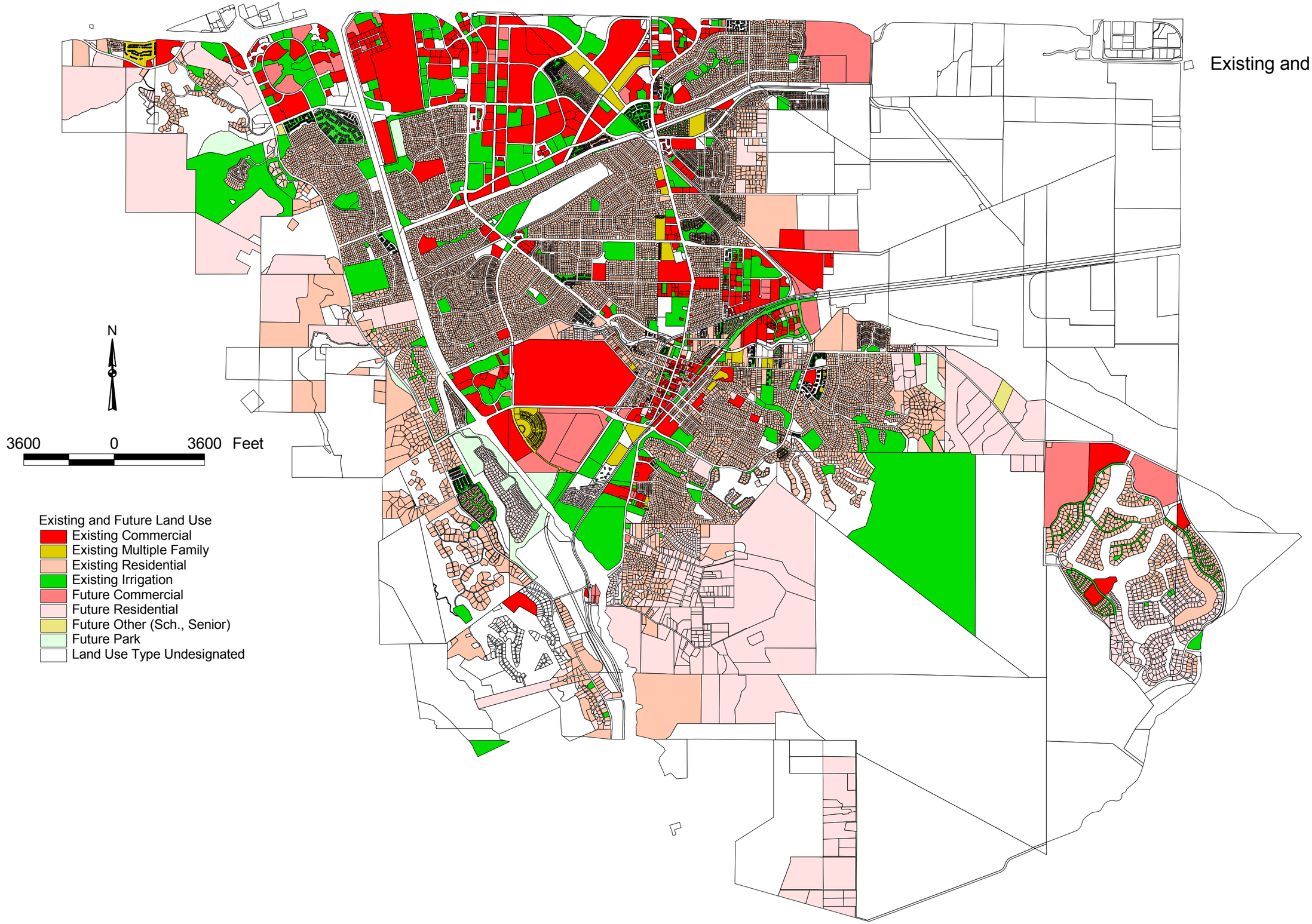


**Table 2-1**
**Distribution of Existing Demands by Customer Class and Zone**

| Zone/Area | % of Total Demands | Single Family | Multi-Family | Commercial | Irrigation |
|---|---|---|---|---|---|
| Lower zone | 80% | 46% | 8% | 14% | 32% |
| Bonde zone | 10% | 85% | 3% | 1% | 11% |
| Ruby Hill (Lower Ruby Hill and Upper Ruby Hill zones) | 5% | 79% | 0% | 1% | 20%(1) |
| 770 zone and supported zones (770, Foothill 770, Deer Oaks, & Lower 770 zones) | 2% | 85% | 11% | 1% | 3% |
| Moller zone and supported zones (Moller 770 & Moller Lower zones) | 1% | 84% | 0% | 0% | 16% (1) |
| Kottinger Ranch zone | 1% | 80% | 0% | 0% | 20%(1) |
| Dublin Canyon | 1% | 27% | 27% | 2% | 44%(1) |
| 510 zone | 1% | 86% | 3% | 0% | 11%(1) |
| Totals | 100% | 53% | 7% | 11% | 29%(1) |

(1) Irrigation is for common areas of residential development.

The Lower zone, which serves over 80 percent of customer demand, is by far the largest pressure zone. Lower zone includes all of the central, flat part of the City below elevation 390 feet. Nearly all commercial demands (98 percent) are located in the Lower zone.

The Lower zone is surrounded by higher-elevation, predominantly residential areas to the west and south, where all the upper pressure zones are located. The upper pressures zones are small and primarily single-family residential, except for Dublin Canyon zone where 27 percent of demands are multi-family residential and 44 percent are irrigation.

# Section 3
# Existing City Water System

This section describes essential features of the City of Pleasanton's existing water system, including supply, distribution, pumping, storage, and valve station facilities. Descriptions of pumping, storage and valve station facilities exclude the rural areas of Santos Ranch and Kilkare Canyon, on Pleasanton Ridge, which are outside of the Master Plan study area, because no significant growth is planned in these areas.

## 3.1 Supplies

The City of Pleasanton's water supplies include groundwater from City-operated wells, and treated surface and groundwater purchased from Zone 7 Water Agency (Zone 7).

Groundwater production from the City's Well 5, Well 6, and Well 8 meets about 20 percent of the City's demands. The wells, which supply water to the Lower zone, are operated year-round on an as-needed basis. The rated capacity of Well 5 is about 2,000 gpm, the rated capacity of Well 6 is about 2,200 gpm, and the rated capacity of Well 8 is about 3,200 gpm, according to City staff. However, as Table 3-1 shows, the daily production rates for these wells can be slightly higher than these rated capacities.

By agreement with Zone 7, the City's annual groundwater production is limited to 3,500 acre-feet per year. That volume is equivalent to an average daily production of 3.12 mgd, just under 20 percent of the City's average day demand of 16.3 mgd. As City demands grow, groundwater provided by the City's wells can be expected to provide a smaller proportion of total supplies.

Six turnouts from the Zone 7 treated water distribution system currently supply the remaining 80 percent of the City's water demand. Turnouts 1 through 5 feed Lower zone and operate on a flow control basis. Each turnout has a reported hydraulic capacity of 5,000 gpm, as shown in Table 3-1. Turnout 7 supplies the Lower and Upper Ruby Hill Zones through the Ruby Hill Pump Station. The turnout hydraulic capacity is 3,300 gpm based on pumping capacity. Daily turnout deliveries are dictated by zone demands.

**Table 3-1**
**Summary of Zone 7 Sources of Supply**

| Turnouts | | | Wells | | |
|---|---|---|---|---|---|
| Facility | Rated Capacity (gpm) | Maximum Reported Daily Flow Rate, 1995-2000 (gpm) (1)(2) | Facility | Rated Capacity (gpm) | Maximum Reported Daily Flow Rate, 1995-2000 (gpm) (3) |
| Turnout 1 | 5,000 | 5,200 | Well 5 | 2,000 | 2,200 |
| Turnout 2 | 5,000 | 5,200 | Well 6 | 2,200 | 2,400 |
| Turnout 3 | 5,000 | 5,200 | Well 8 | 3,200 | 3,500 |
| Turnout 4 | 5,000 | 5,000 | | | |
| Turnout 5 | 5,000 | 5,200 | | | |
| Turnout 7 | 3,300 | 1,700 | | | |

(1) Flows are maximum flows for individual turnouts. The combined turnout capacity is constrained by pipeline capacity in the Zone 7 and Pleasanton systems.
(2) From daily totalizing meter records (outliers removed).
(3) Estimates provided by City staff.

Although the theoretical combined capacity of Turnouts 1 through 5 is 25,000 gpm (36 mgd), the actual amount delivered is constrained by pipeline capacity in both the City's and Zone 7's distribution systems, and other factors. For reference, the maximum combined flowrate of Turnouts 1 through 5 was 26.0 mgd in 2000 (without Turnout 1 operating) and 23.8 mgd in 2001 (without Turnout 3 operating). The maximum capacity of Turnouts 1 through 5 operating simultaneously is not known.

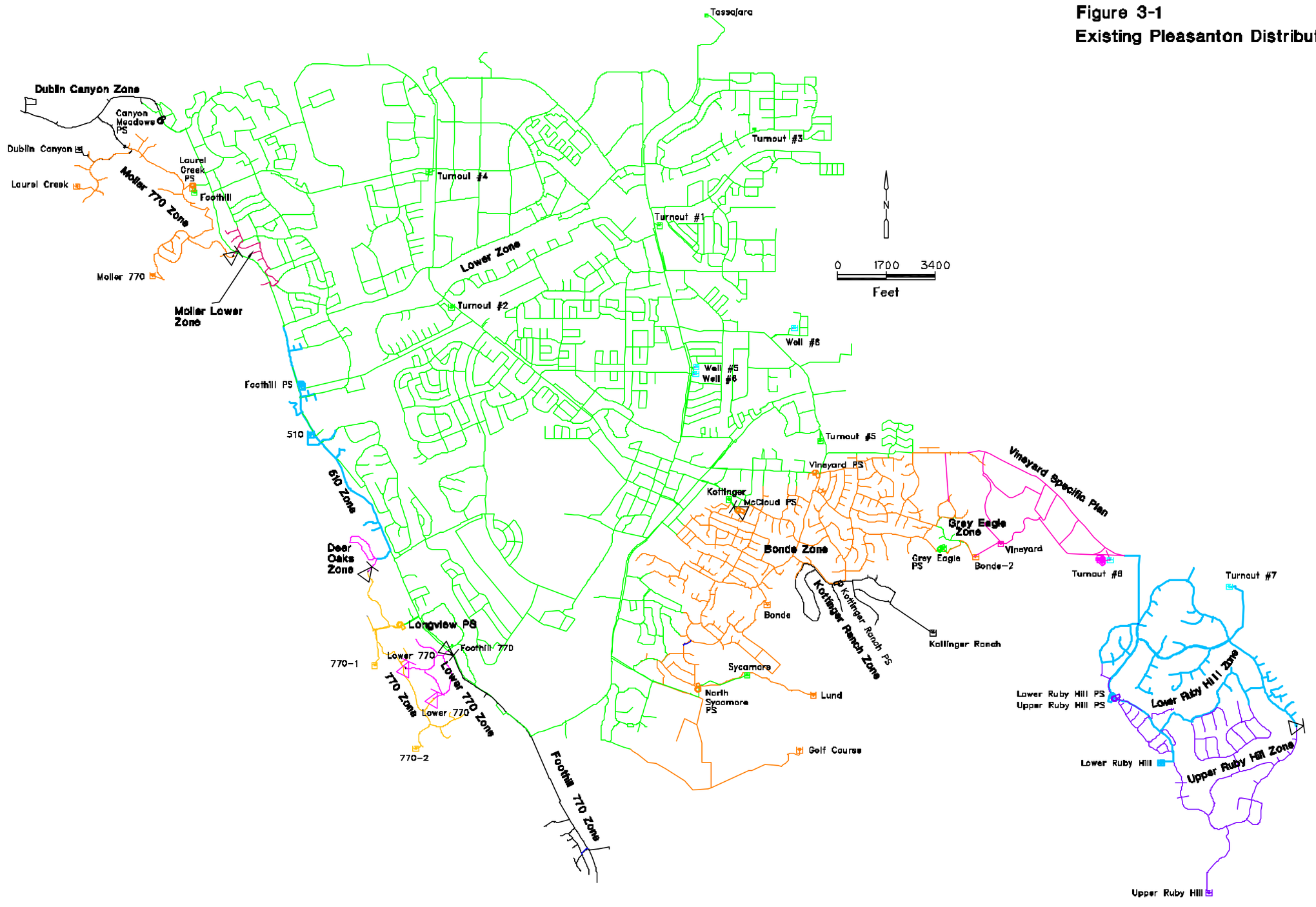
Turnout 7 feeds the suction line of the combined Lower Ruby Hill/Upper Ruby Hill pump station. Pump station capacity and suction pressure concerns limit the instantaneous hydraulic capacity of this turnout to about 3,300 gpm (4.8 mgd). A seventh turnout, Turnout 6, has been constructed but is not currently in operation. It has the same configuration as Turnout 7, and will be available to feed the suction side of a future pump station that will supply the Vineyard Specific Plan and Ruby Hill areas.

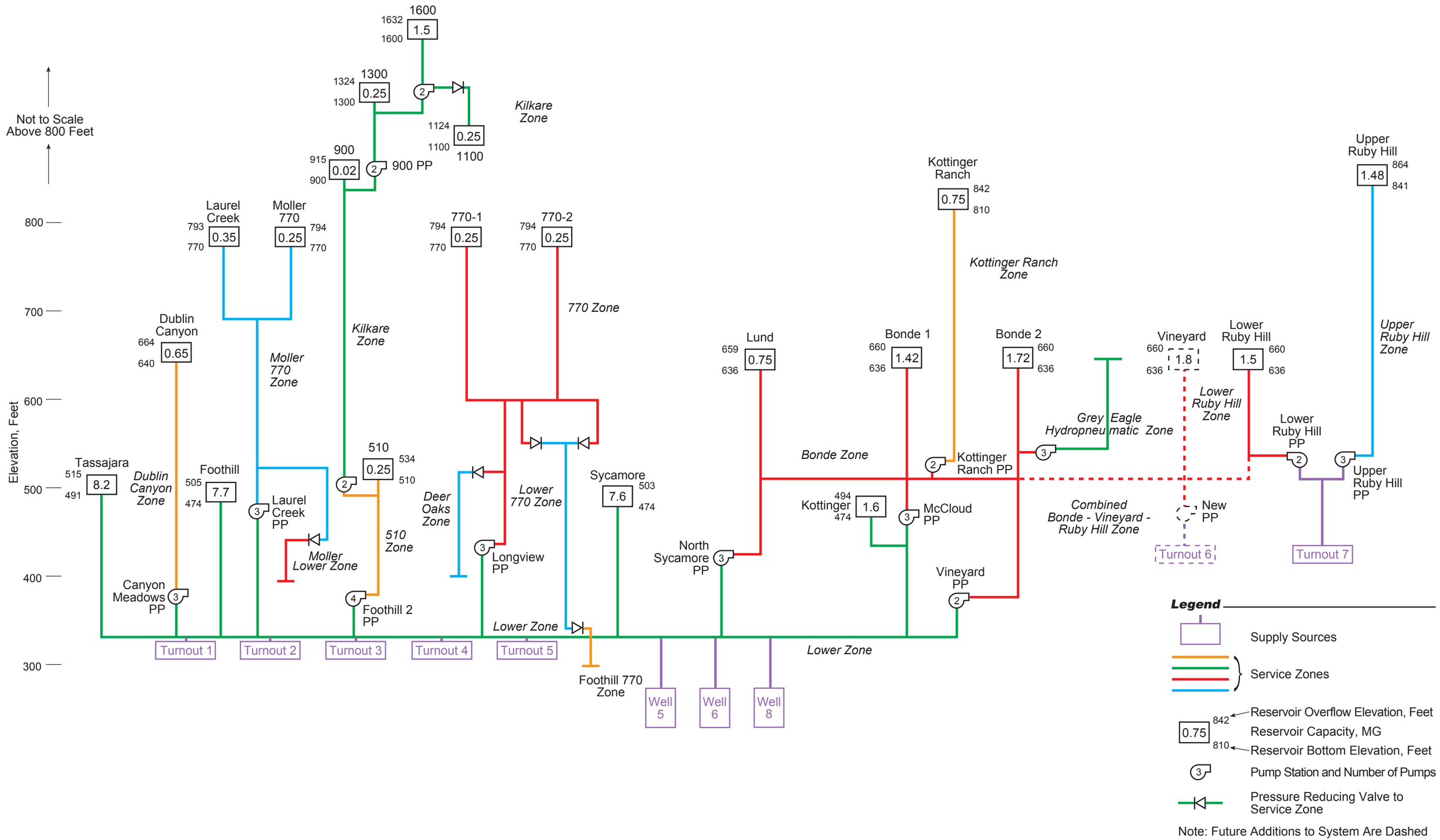
## 3.2 Distribution System

The City's water distribution system includes storage reservoirs, pump stations, and pipelines in eighteen pressure zones. Four of these pressure zones serve Kilkare Canyon and the Santos Ranch Road area of Pleasanton, which are outside of the Water Master Plan study area. The remaining fourteen pressure zones include nine zones with elevated storage reservoirs, four pressure-regulated zones, and one hydropneumatic zone. Table 3-2 summarizes statistics for each of the pressure zones within the study area, including customer service elevations, reservoir overflow elevations, and static service pressures.

Figure 3-1 presents a map showing the locations of the pressure zones. Figure 3-2 is a schematic of the City's pressure zones, showing both existing facilities and facilities planned to be installed in the near future.

**Figure 3-1**
**Existing Pleasanton Distribution System**






CDM

**Figure 3-2**
**Water Distribution System Schematic**

**Table 3-2**
**Existing Pressure Zones within the Water Master Plan Study Area**

| Zone | Zone Type | Existing Customer Service Elevations (ft) (1) | Reservoir Overflow Elevation or PRV Setting (ft) | High Service Elevation Criterion (ft) (3) | Range of Static Service Pressures (psi) |
|---|---|---|---|---|---|
| Lower | Reservoir | 305 - 390 | 505 (Foothill) | 390 | 86 |
| Dublin Canyon | Reservoir | 420 - 540 | 664 | 560 | 55 - 106 |
| Moller 770 | Reservoir | 430 - 690 | 794 | 690 | 45 - 157 |
| Moller Lower | PRV-Controlled | 355 - 440 | 615 (2) | 510 | 75 - 112 |
| 770 | Reservoir | 500 - 700 | 794 | 690 | 40 - 127 |
| Foothill 770 | PRV-Controlled | 280 - 340 | 509 (2) | 400 | 74 - 99 |
| Deer Oaks | PRV-Controlled | 390 - 530 | 709 (2) | 600 | 77 - 138 |
| Lower 770 | PRV-Controlled | 350 - 520 | 629 (2) | 520 | 47 - 121 |
| 510 | Reservoir | 355 - 430 | 534 | 430 | 45 - 78 |
| Grey Eagle | Hydropneumatic Tank | 510 - 655 | 763 (2) | 620 | 46 - 109 |
| Bonde | Reservoir | 360 - 550 | 660 | 550 | 46 - 130 |
| Kottinger Ranch | Reservoir | 495 - 705 | 842 | 730 | 60 - 150 |
| Ruby Hill Lower | Reservoir | 425 - 550 | 660 | 550 | 49 - 101 |
| Ruby Hill Upper | Reservoir | 510 - 630 | 864 | 760 | 101 - 154 |

Notes:
(1) Elevation range of existing modeled customer demands, rounded to the nearest five feet.
(2) HGL equivalent to 50 psi into Moller Lower zone, 75 psi into Foothill 770 zone, 80 psi into Deer Oaks zone, 43 psi into Lower 770 zone, and 100 psi into Grey Eagle zone.
(3) Approximately 110 feet lower than reservoir overflow elevation.

There are over 277 miles of transmission and distribution pipelines ranging from 6-inch to 27-inch diameter in the City's existing water system. Of these, 233 miles are included in the hydraulic model developed for the Water Master Plan. Just under 50 percent of the pipelines in the City's system are asbestos-cement, while another 20 percent are polyvinyl chloride (PVC). The remaining pipeline materials include ductile iron, steel, and cast iron. The majority of the large diameter pipelines (16-inch and larger) are in Lower zone, distributing water throughout the zone and conveying water to pump stations to feed higher zones.

## 3.3 Storage Reservoirs

The Water Master Plan study area includes sixteen storage reservoirs with a total storage capacity of approximately 35 million gallons. Table 3-3 lists the nominal capacity of each reservoir, as reported in the summary records of the City's Utility Division. For most reservoirs, this nominal capacity differs only slightly from modeled capacity, which is based on actual reservoir dimensions. However, as noted in the table, the current usable capacity of Tassajara Reservoir is much less than the nominal capacity, since the overflow elevation is about 10 feet higher than the normal gradient in the Lower zone.

**Table 3-3**
**Existing Storage Reservoirs**

| Zone Name | Reservoir Name | Material | Diameter | Bottom Elevation (ft) | Depth to Overflow (ft) | Overflow Elevation (ft) | Nominal Capacity (mg) |
|---|---|---|---|---|---|---|---|
| Lower | Foothill | Concrete | 213 | 474 | 30.5 | 505 | 7.73 |
| | Sycamore | Concrete | 220 | 474 | 29.0 | 503 | 7.60 |
| | Tassajara | Concrete | hopper-type | 491 | 23.5 | 515 | 8.20[1] |
| | Kottinger | Concrete | 122 | 474 | 19.5 | 494 | 1.60 |
| Dublin Canyon | Dublin Canyon | Steel | 71 | 640 | 23.5 | 664 | 0.65 |
| Moller 770 | Laurel Creek | Steel | 52 | 770 | 23.5 | 794 | 0.35 |
| | Moller 770 | Steel | 63 | 770 | 23.5 | 794 | 0.50 |
| 770 | 770-1 | Steel | 43 | 770 | 23.5 | 794 | 0.25 |
| | 770-2 | Steel | 45 | 770 | 23.5 | 794 | 0.25 |
| 510 | 510 | Steel | 43 | 510 | 23.5 | 534 | 0.25 |
| Bonde | Bonde-1 | Concrete | 106 | 636 | 23.0 | 659 | 1.42 |
| | Bonde-2 | Concrete | 119 | 636 | 24.0 | 660 | 1.72 |
| | Happy Valley | Steel | 77 | 636 | 23.0 | 659 | 0.75 |
| | Lund | Steel | 77 | 636 | 23.0 | 659 | 0.75 |
| Kottinger Ranch | Kottinger Ranch | Steel | 65 | 810 | 31.5 | 842 | 0.75 |
| Lower Ruby Hill | Lower Ruby Hill | Steel | 103 | 636 | 23.5 | 660 | 1.50 |
| Upper Ruby Hill | Upper Ruby Hill | Steel | 106 | 841 | 23.5 | 864 | 1.48 |
| TOTAL | | | | | | | 35.00 |

Notes:
(1) Only about 4.25 mg of Tassajara's storage is usable. See Section 6.

## 3.4 Pump Stations

The Water Master Plan study area includes a total of twelve pump stations. The pump stations serve all zones except Lower zone, which is fed by gravity from Zone 7 turnouts and the City's wells. Table 3-4 lists the capacity and other essential features of each pump station.

**Table 3-4**
**Existing Pump Stations**

| Pump Station Name | Source Zone | Service Zone | No. of units | Total HP | Total Capacity (mgd) | Firm Capacity (mgd) [1] |
|---|---|---|---|---|---|---|
| Canyon Meadows | Lower | Dublin Canyon | 2 | 250 | 2.7 | 1.4 |
| Laurel Creek | Lower | Moller 770 | 3 | 150 | 1.7 | 1.2 |
| Longview | Lower | 770 | 3 | 225 | 1.9 | 1.2 |
| Foothill 2 | Lower | 510 | 4 | 40[2] | 2.0 | 1.2 |
| McCloud | Lower | Bonde | 3 | 190[3] | 4.0 | 2.5 |
| Vineyard | | | 2 | 60 | 2.3 | 1.2 |
| North Sycamore | | | 3 | 300 | 5.8 | 3.8 |
| Grey Eagle | Bonde | Grey Eagle | 2 | 15 | 0.3 | 0.2 |
| Grey Eagle Fire Pump | Bonde | Grey Eagle | 1 | 100 | 2.2 | - |
| Kottinger Ranch | Bonde | Kottinger Ranch | 2 | 40 | 1.2 | 0.6 |
| Ruby Hill Lower | Zone 7 | Ruby Hill Lower | 2 | 40 | 2.5 | 1.3 |
| Ruby Hill Upper | Zone 7 | Ruby Hill Upper | 3 | 75 | 2.7 | 1.8 |
| Total – System | | | | | 29.3 | 15.2 |

Notes:
(1) Firm Capacity = Capacity with largest pump reserved as a standby unit. Capacities are based on flow rates as reported by SCADA on 6/21/01.
(2) Two 5-HP pumps and two 15-HP pumps.
(3) Two 75 HP pumps and one 40-HP pump.

## 3.5 Pressure Reducing Stations

The Water Master Plan study area includes five pressure reducing stations. Table 3-5 lists the capacity and other essential features of each pressure reducing station.

**Table 3-5**
**Existing Pressure Reducing Stations**

| Pressure Reducing Station Name | Source Zone | Service Zone | Valve Sizes | Total Capacity (gpm) |
|---|---|---|---|---|
| Foothill 770 | Lower 770 | Foothill 770 | Two 2”, one 6” | 2,200 |
| Deer Oaks | 770 | Deer Oaks | Two 2”, one 6” | 2,200 |
| Moller Lower | Moller | Lower Moller | Two 2”, one 8” | 3,500 |
| Lower 770-1 | 770 | Lower 770 | Two 2”, one 8” | 3,500 |
| Lower 770-2 | 770 | Lower 770 | Two 2”, one 8” | 3,500 |

# Section 4
# Water Demands

CDM developed demand projections for the City through buildout. The City is currently about 80 percent built out, with full buildout anticipated by 2015. Current average daily water demand is 16 mgd. Anticipated buildout average daily water demand is 21 mgd.

The City's GIS and water customer billing database were used to establish locations of existing water demand. Water demand projections for buildout conditions were developed using detailed planning information for future development along with historic water demand information by customer class to establish usage for future development.

This section reviews historic water trends, discusses development of projected water demands, and allocation of these demands to the hydraulic model.

## 4.1 Historic Water Production

Figure 4-1 shows historic average daily water production in million gallons per day (mgd) for 1989 through 2001. Production data includes water supply provided by Zone 7 through several turnouts to the City system and the City's wells. Production has increased from about 12 mgd in the late 1980's and early 1990's to about 16 mgd by 2001. The average annual increase in production is about 0.4 mgd/year.

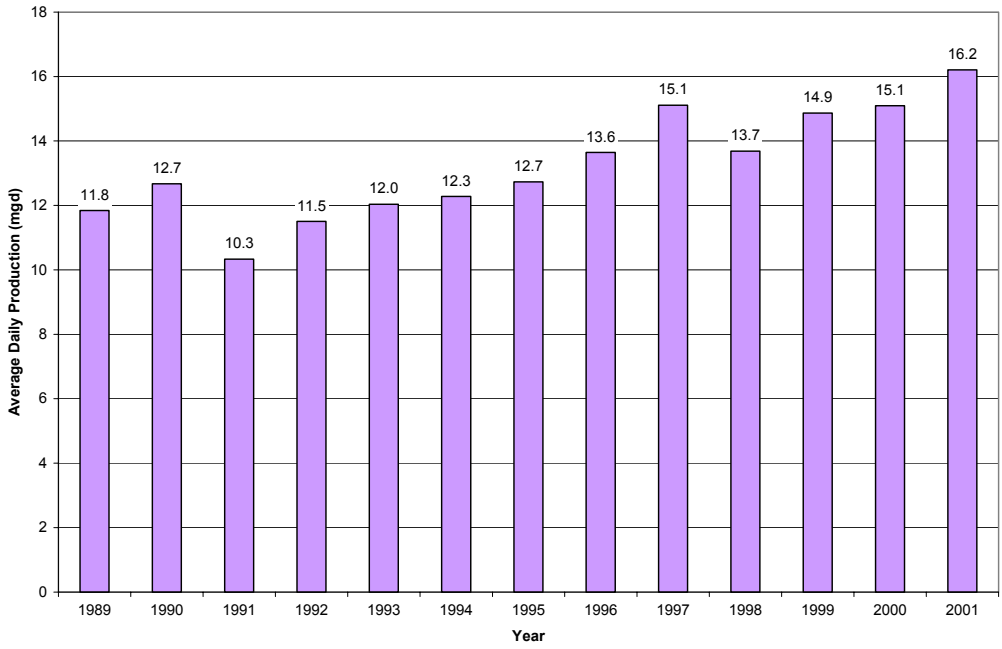



**Figure 4-1**
**Historic Water Production**

## Customer Billing Records

The City's Utility Billing Department maintains a customer billing database for recording metered usage and generating customer bills. CDM used data from the customer billing database, along with the City's GIS for parcel information, to establish location of existing water demand, and to develop future demands.

Billing database water demand for year 2000 was 14.1 mgd, compared with year 2000 production of 15.1 mgd. Billing is bi-monthly, with meter readings taken shortly before each billing cycle, and billing cycle dates varying depending on the meter route. Total water demand for six consecutive billing periods between December 1999 and January 2001 was used to establish total water demand for year 2000 and corresponding average daily water demand. Records were then uniformly adjusted upward to match year 2001 system production of 16.3 mgd to represent existing system demand.

The billing database uses general categories (as shown in Table 4-1 below) to identify water demand types. Table 4-1 summarizes year 2000 water demand statistics by the customer classes defined in the billing database.

***Table 4-1***
***Year 2000 Water Demand by Customer Class***

| *Customer Class* | *Meter Designation and Size(s)* | *Year 2000 Water Demand (mgd)* | *Percent of Total* |
|---|---|---|---|
| Single Family Residential | 5/8" – 1" | 7.5 | 53 |
| Multiple Family Residential | 1.5" – 6" | 1.0 | 7 |
| Commercial | Com (varies) | 1.6 | 11 |
| Irrigation | Irr (varies) | 4.0 | 29 |
| **Total** | | 14.1 | 100 |

## Unaccounted for Water

Due to distribution system losses, meter error, or billing cycle versus calendar year differences, the volume of water accounted for by the City's billing database is smaller than actual annual production. From 1991 to 1999, between 6.0 percent and 14.6 percent of production was unaccounted for on an annual basis. Average annual losses during this period were equal to 8.7 percent of annual production. Based upon the City's recommendation, a loss ratio of 8.5 percent was used in the master plan evaluation.

# 4.2 Existing and Projected Water Demands

Table 4-2 summarizes existing and buildout demands for the City by pressure zone. Current average daily demand is about 16 mgd and is projected to increase to about 21 mgd by buildout. Demands are expected to increase primarily due to residential development in Lower, Bonde, and Ruby Hill zones, commercial development throughout Lower zone, and the addition of new irrigated parks in Lower zone.

**Table 4-2**
**Existing and Projected Average Day Demands by Zone**

| Zone | Existing Average Day Demand | | Buildout (2015) Avg. Day Demand | |
|---|---|---|---|---|
| | (gpm) | (mgd) | (gpm) | (mgd) |
| Lower | 9022 | 12.99 | 10832 | 15.60 |
| Dublin Canyon | 70 | 0.10 | 142 | 0.20 |
| Moller 770 | 109 | 0.16 | 164 | 0.24 |
| Moller Lower | 45 | 0.06 | 48 | 0.07 |
| 770 | 76 | 0.11 | 97 | 0.14 |
| Foothill 770 | 99 | 0.14 | 141 | 0.20 |
| Deer Oaks | 12 | 0.02 | 13 | 0.02 |
| Lower 770 | 33 | 0.05 | 41 | 0.06 |
| 510 | 60 | 0.09 | 77 | 0.11 |
| Kilkare | 49 | 0.07 | 49 | 0.07 |
| Grey Eagle | 37 | 0.05 | 38 | 0.06 |
| Bonde | 1079 | 1.55 | 1433 | 2.06 |
| Vineyard | - | - | 218 | 0.31 |
| Kottinger Ranch | 104 | 0.15 | 179 | 0.26 |
| Ruby Hill Lower | 360 | 0.52 | 438 | 0.63 |
| Ruby Hill Upper | 174 | 0.25 | 468 | 0.67 |
| **Total** | **11330** | **16.32** | **14378** | **20.70** |

Note: Demands include 8.5% losses, and demands are scaled to year 2001 (7.2% greater than year 2000 consumption database).

Future planning within the City of Pleasanton is guided by the City of Pleasanton General Plan, as well as special study areas, such as the Vineyard Corridor and North Sycamore area, where comprehensive development is planned. The City Planning and Community Development Department maintains detailed statistics on future development of vacant parcels based on information from approved development projects, special study areas, and other planned projects.

Water demand projections were developed using information about planned future development provided by the City Planning and Community Development Department. Unit water demand factors were applied to six different land use categories: residential, commercial, parks, schools, fire stations, and senior housing. Unit water demand factors for each of these land use types are discussed below and shown in Table 4-3. Appendix B includes detailed planning information and water demand calculations used to derive future water demands.

**Table 4-3**
**Unit Water Demand Factors and Residential Future Average Day Demand Projections**

| Land Use Type | Water Demand Factor | No. of Units Planned | Future Average Day Demands | |
|---|---|---|---|---|
| | | | (mgd) | (gpm) |
| Residential | 0.2 - 1.1 gpm/unit | 2869 units | 2.15 | 1496 |
| Commercial | 0.01 - 0.87 gpd/ft$^2$ | 8,868,691 ft$^2$ | 0.66 | 455 |
| Park | 2678 gpd/acre | 289 acres | 0.77 | 532 |
| School | 25 gpd/student | 4650 students | 0.12 | 81 |
| Fire Station | 0.23 gpd/ft$^2$ | 4000 ft$^2$ | 0.001 | 0.64 |
| Senior Housing | 0.87 gpd/ft$^2$ | 409,434 ft$^2$ | 0.36 | 247 |
| | | **Total:** | **4.05** | **2811** |

Note: Demands in Table 4-3 do not include 8.5% losses.

## Residential

Eighteen different residential unit water demand factors were developed and applied to 95 future residential development parcels identified by the City of Pleasanton, resulting in a total of 1496 gpm average daily demand for all future residential development. Each of the unit water demand factors was developed based on billing records for existing residential customers in adjacent areas with similar densities as planned development. For example, the calculated unit water demand factors for future development in Ruby Hill is 0.98 gpm/unit, which is the average unit water demand for existing Ruby Hill customers. The smallest unit water demand factor of 0.2 gpm/unit was used for apartments and other high-density development, while the largest unit water demand factor of 1.1 gpm/unit was applied to new development in Foothill 770 zone. The City-wide average rate for all future residential parcels is 0.5 gpm/unit.

## Commercial

City of Pleasanton staff provided CDM with unit water demand factors for approximately 85 future commercial parcels in eighteen categories (retail, service, restaurants, etc.). Some planned development includes re-development of areas with existing development. According to the City, existing water demands are typically small for planned re-development areas, so the same future demand factors were applied to both new development of currently vacant areas and re-development of already developed parcels.

Table 4-4 shows commercial demands by development type for the largest development types. Development types totaling less than 20 gpm are not shown individually, but are aggregated under the category "All Others." Total future commercial demand is estimated to be 455 gpm. The highest unit water demand factor is for restaurants (0.61 gpd/ft$^2$), while the lowest is for self-storage (0.01 gpd/ft$^2$). The average rate for all commercial development is 0.074 gpd/ft$^2$.

| Table 4-4<br>Unit Water Demand Factors and Future Commercial Demand Projections | | | |
|---|---|---|---|
| **Development Type** | **Water Demand Factor ($gpd/ft^2$)** | **Projected Future Development ($ft^2$)** | **Future Average Day Demands (gpm)** |
| Office | 0.05 | 4,452,923 | 155 |
| Public and Institutional | 0.16 - 0.162 | 337,713 | 68 |
| Industrial & Service | 0.08 - 0.09 | 773,379 | 47 |
| Service | 0.08 | 674,037 | 39 |
| Light Manufacturing | 0.09 | 560,535 | 35 |
| Retail | 0.07 | 482,878 | 23 |
| R&D/Light Manufacturing | 0.07 | 457,614 | 22 |
| Medical | 0.17 | 168,248 | 20 |
| All Others (9 categories) | 0.01 – 0.61 | 961,364 | 46 |
| **Total** | 0.074 *(avg.)* | 8,868,691 | 455 |

## Parks and Schools

The City projects that 307 acres of parkland will be developed. Of these, 265 acres were assumed to be developed with extensive turf area, and 42 acres with a mix of irrigated turf and open space. An average day demand of 3 acre-feet/acre/year was used for parks with extensive turf area and a unit water demand of 1.5 acre-feet/acre/year was used for parks with a mix of open space and irrigated area. Over half of future park water demand (279 gpm of 532 gpm total) is attributable to the planned 150-acre Bernal Community Park.

Future development includes one new elementary school and two new high schools. CDM used an average annual unit water demand factor of 25 gallons per day per student, based on past master planning estimates. Future schools have a projected average daily demand of 81 gpm.[1]

# 4.3 Allocation of Demands to the Hydraulic Model

Demand allocation to the hydraulic model was performed using the following information provided by the City:

- Water customer billing database for calendar year 2000, listing demands by Assessor's Parcel Number (APN) and water meter type (single-family residential, multi-family, commercial, etc.)
- GIS database of City parcels, including APN.
- Zone boundaries, as established by the City's GIS layer and distribution system maps.

[1] Usage represents average annual use and no attempt is made to evaluate seasonal variations in use based on the length of the school year.

The process of creating the spatial distribution of water demands for the hydraulic model of the City distribution system included the following procedures:

- Excluding nodes from the demand allocation process for locations where there are no customer service connections. Such locations include nodes at high elevations near reservoirs and nodes at the suction and discharge side of pump stations.
- Matching each customer billing record with its corresponding parcel in the GIS parcel database. Some billing records correspond to multiple parcels.
- Establishing the "center" of each parcel using a GIS routine to find polygon centroids.
- Using a GIS routine to match the geographic center of each parcel with the nearest modeled node. Each parcel was matched with only one node, but each node could be matched with multiple parcels.
- Manually checking the results of the GIS parcel-node matching routine to enforce zone boundaries.
- Calculating demands by node, by summing up the billing records associated with all the parcels nearest each node.

The actual sum of demands from the billing record database was 14.1 mgd. Just under 1 percent of the billing records could not be matched with specific parcels in the GIS parcel database and were consequently not assigned. As a result, the allocated average day demands totaled 14.0 mgd.

Billing record demands were increased by 8.5 percent to account for distribution system losses. They were then increased by another 7.2 percent to account for the increase in demands between 2000 and 2001. Applying these factors results in an average model demand of 16.3 mgd, which is just slightly larger than the actual average production of 16.2 mgd experienced in 2001.

## 4.4 Peak Water Demand

For Water Master Plan analysis, it is customary to evaluate distribution system performance under anticipated peak demand conditions. Typically, maximum day demand conditions are used to evaluate the ability of the system to meet fire flow, and to meet hourly demand on the maximum day. Therefore, maximum day to average day peaking factors and hourly water demand under peak conditions were assessed using historic operating data.

### Maximum Day to Average Day Peaking Factor

Table 4-5 summarizes average day and maximum day water demand statistics for 1995 through 2001. Maximum Day to Average Day peaking factors for this seven-

year period shown in Table 4-5 range from 1.99 to 2.29. Table 4-5 also summarizes annual rainfall for these years, as a percent of the long-term average rainfall[2]. Although there is some variation, years with lower rainfall also tend to have lower peaking factors, indicative of higher average water demand throughout the year due to lower rainfall. The highest peaking factor occurred in 1998, when rainfall was 154 percent of normal rainfall. Based on this review, a maximum day to average day peaking factor of 2.2 was initially selected. With subsequent adjustments described below in the section on peak water demand by zone, a 2.3 system-wide factor was used.

**Table 4-5**
**Max Day/Average Day Peaking Factors for 1995-2001**

| Year | Maximum Day Demand (mgd) | Date of Max Day Demand (mgd) | Average Day Demand | Peaking Factor | Rainfall (Percent of Average Annual Rainfall) |
|---|---|---|---|---|---|
| 1995 | 27.6 | 7-16-95 | 12.7 | 2.17 | 147% |
| 1996 | 27.5 | 9-01-96 | 13.6 | 2.02 | 154% |
| 1997 | 31.2 | 7-27-97 | 15.1 | 2.07 | 92% |
| 1998 | 31.4 | 8-29-98 | 13.7 | 2.29 | 154% |
| 1999 | 29.5 | 7-14-99 | 14.9 | 1.99 | 75% |
| 2000 | 34.1 | 7-29-00 | 15.4 | 2.21 | 91% |
| 2001 | 35.9 | 6-21-01 | 16.2 | 2.22 | 105% |

Recent trends indicate a higher peak water demand in recent years. Both the 1985 and 1991 Water Master Plans used a maximum day to average day peaking factor of 2.0, which is consistent with the peaking factors observed between 1974 and 1984.

## Peak Water Demand by Zone

To determine whether Maximum Day to Average Day peaking factors vary significantly by zone, average day demands established by the City's customer billing database were compared with the zone demands experienced on June 21, 2001, the maximum demand day in 2001. Zone demands were calculated using SCADA data for total pumping and change in storage in each zone.

The results of this analysis showed that three zones (Lower Ruby Hill, Upper Ruby Hill, and 770) have Maximum Day to Average Day peaking factors that are significantly higher than 2.2. This result is consistent with higher peak water demand for residential areas with large lots and correspondingly large irrigation demands. The 2001 Maximum Day to Average Day peaking factor based on total use in these three zones was 3.0. Therefore, this peaking factor was used. A 3.0 peaking factor was also applied to the Vineyard Specific Plan Area, which will also have large residential lots. A peaking factor of 2.2 was applied in all other zones. Table 4-6 shows Average Day and Maximum Day demands by zone for existing and buildout conditions.

[2] National Climatic Data Center Station 044997, Livermore, Mean Annual Rainfall 14.69 inches, 1930 through 2002.

**Table 4-6**
**Existing and Projected Average Day and Maximum Day Demands by Zone**

| Zone | Max. Day to Avg. Day Peaking Factor | Existing Demands | | Buildout (2015) Demands | |
|---|---|---|---|---|---|
| | | Average Day (mgd) | Maximum Day (mgd) | Average Day (mgd) | Maximum Day (mgd) |
| Lower | 2.2 | 12.99 | 28.58 | 15.60 | 34.32 |
| Dublin Canyon | 2.2 | 0.10 | 0.22 | 0.20 | 0.45 |
| Moller 770 | 2.2 | 0.16 | 0.35 | 0.24 | 0.52 |
| Moller Lower | 2.2 | 0.06 | 0.14 | 0.07 | 0.15 |
| 770 | 3.0 | 0.11 | 0.33 | 0.14 | 0.42 |
| Foothill 770 | 3.0 | 0.14 | 0.43 | 0.20 | 0.61 |
| Deer Oaks | 3.0 | 0.02 | 0.05 | 0.02 | 0.05 |
| Lower 770 | 3.0 | 0.05 | 0.14 | 0.06 | 0.18 |
| 510 | 2.2 | 0.09 | 0.19 | 0.11 | 0.24 |
| Kilkare | 2.2 | 0.07 | 0.16 | 0.07 | 0.16 |
| Grey Eagle | 2.2 | 0.05 | 0.12 | 0.06 | 0.12 |
| Bonde | 2.2 | 1.55 | 3.42 | 2.06 | 4.54 |
| Vineyard | 3.0 | - | - | 0.31 | 0.94 |
| Kottinger Ranch | 2.2 | 0.15 | 0.33 | 0.26 | 0.57 |
| Ruby Hill Lower | 3.0 | 0.52 | 1.56 | 0.63 | 1.89 |
| Ruby Hill Upper | 3.0 | 0.25 | 0.75 | 0.67 | 2.02 |
| **Total** | **2.3 (avg.)** | **16.32** | **36.76** | **20.70** | **47.18** |

Note: Demands include 8.5% losses, and demands are scaled to year 2001 (7.2% greater than year 2000 consumption database)

## Hourly Peaking Factors

Hourly peaking factors, or diurnal curves, are used to evaluate water system performance over the course of the day during peak demand conditions. Diurnal curves were developed using SCADA data generated on June 21, 2001, the maximum demand day in 2001, and September 26, 2001, when the City conducted hydrant testing for hydraulic model calibration. The June data were used to develop the diurnal curves, while the September data were used as a comparison for reasonableness.

The City's Lower zone includes a large commercial sector, with significant commercial development in and around the Hacienda Business Park. All other zones have either predominantly or exclusively residential land uses. Because of these differences, CDM evaluated hourly water demand by pressure zone, and developed two diurnal curves, one for Lower zone and one for all other zones, to reflect differences in hourly water demand, due to different land use types.

The diurnal curves were developed based on an hourly water balance for each zone or group of zones, where:

Demand = (Flow in from pumps, turnouts or wells) – (Flow out through pumps) – (Change in storage)

Figure 4-2 shows the diurnal curves for Lower zone and all other zones. The Lower zone curve was smoothed relative to the curve produced by the raw SCADA data. The upper zones curve was developed based on a review and aggregation of upper zone curves. As Figure 4-2 illustrates, there are several important differences between the two diurnal curves. In general, the Lower Zone, which has a combination of residential and commercial use, has a flatter diurnal curve. In contrast, other zones are predominantly residential and have a diurnal curve that reflects residential use patterns. The peak for Lower zone occurs earlier in the day, at 5:00 AM instead of 7:00 AM as in the upper zones. When the peak occurs, it is not as high in Lower zone: only 1.4, compared with 2.5 in the upper zones. Finally, the evening peak in Lower zone extends much further into the early morning, instead of dropping off after 8:00 PM as in the upper zones.

By comparison, the 1991 Water Master Plan used a single diurnal curve, derived from 1989 production facilities and reservoir level data for Lower zone. The 1991 curve had a single curve and had a peak water demand at 6:00 AM, with a multiplier of 1.54. The use of two curves should better reflect differences in water demand patterns within the system due to different combinations of residential and commercial use.

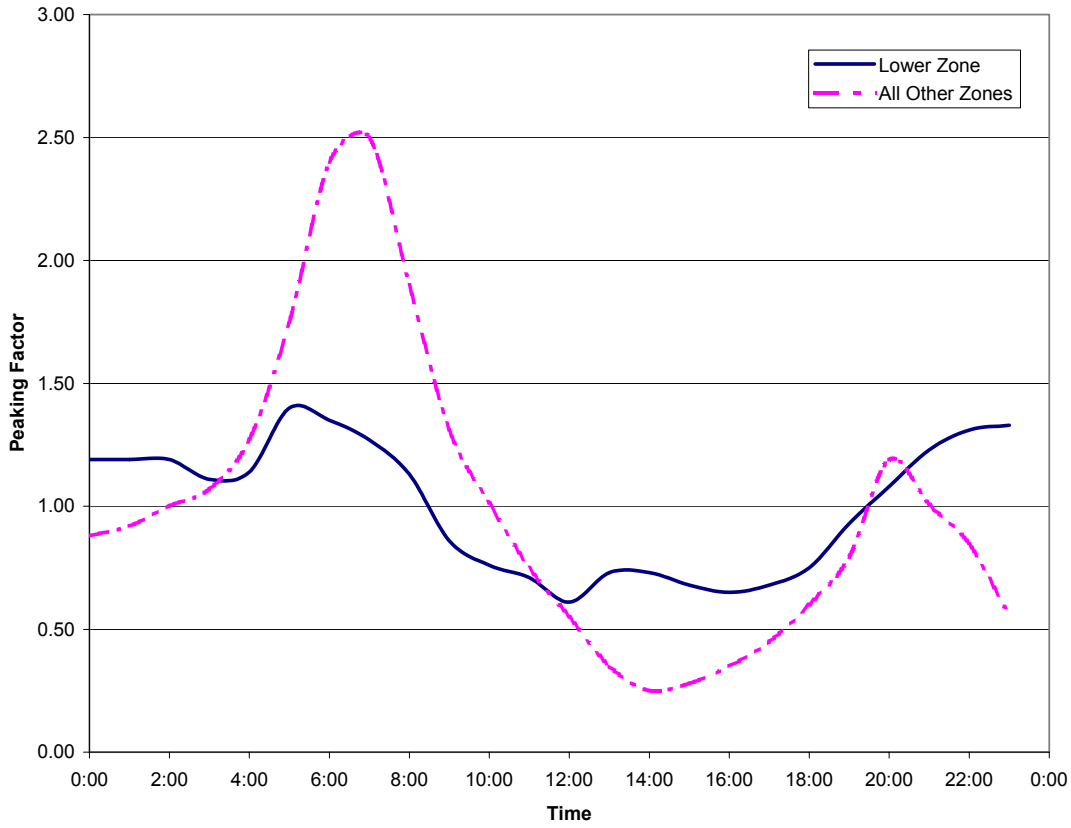



**Figure 4-2**
**Diurnal Curves**

# Section 5
# System Performance Criteria

This section presents the Water Master Plan criteria used to evaluate system performance. The section reviews the criteria used to size new reservoirs, pump stations, pressure reducing stations, and distribution pipelines.

For the Master Plan evaluation, CDM compiled facilities sizing criteria used by eight San Francisco Bay Area utilities, ranging in size from 4 mgd to 200 mgd average daily demand. This information is presented for comparison with the City of Pleasanton master planning criteria, along with CDM's recommendations for criteria to be used for the master plan evaluation. The section also reviews fire flows required for fire protection, which are established by the Livermore-Pleasanton Fire Department.

## 5.1 Reservoir Sizing

Water system reservoir storage is typically sized based on three components:

- Operational storage (also called equalizing or balancing storage)
- Fire reserve storage
- Emergency storage

In addition, water quality considerations can factor into reservoir storage sizing. This section reviews each of these topics, presents a comparison of the City's current criteria with other local agencies, and concludes with recommendations.

### Operational Storage

Operational (equalization) storage is the volume of water required to meet daily fluctuations in demand. Providing operational storage allows zone supplies to be operated at a relatively constant rate throughout the day. With operational storage to meet peak hour needs, supplies are generally designed for the average flow on the maximum demand day.

The 1991 Water Master Plan found that 16 percent of maximum day demand would need to be met from storage, based on the City's diurnal curve, and recommended that 25 percent be used for the criterion. The new diurnal curves indicate that 12 percent of the maximum day demand in Lower zone is met from storage, while 20 percent of the maximum day demand in the upper zones is met from storage. These figures indicate that the operational storage criterion of 25 percent is adequate for upper zones but somewhat conservative for Lower Zone. Although the criterion was not reduced for the Lower Zone, the conservativeness was taken into account when considering storage improvements.

## Fire Reserve Storage

Fire reserve storage is the amount of storage volume necessary to supply fire flow for the most critical land use within a pressure zone. The fire reserve storage is typically computed for each pressure zone, based on the most restrictive (highest) fire flow requirement times the duration for which it must be supplied. The fire reserve storage should always be available for fire protection to every part of the distribution system, unless pump stations supplying the zone have standby power.

## Emergency Storage

Emergency storage is the volume of water required to supply the service area during planned or unplanned equipment outages, power outages, or loss of treatment plant production. The storage needs to be adequate to provide a reasonable level of uninterrupted service under these circumstances. Emergency use of stored water might occur during the following events:

- Outage of Zone 7 supply
- Electrical power outage
- Equipment or pipeline failure

The City's current emergency storage criterion is storage volume equal to 50 percent of maximum day demand.

## Water Quality Considerations

Traditionally, water utilities in the industry have not incorporated water quality considerations into planning criteria. However, as more purveyors switch to chloramine, with the associated potential for nitrification, reservoir water quality is an issue receiving more attention. Some utilities have incorporated water quality considerations into planning. Typically, criteria do not include specific goals that impact sizing, but rather measures to be incorporated into design, such as inlet/outlet designs to promote mixing within the reservoir, siting of reservoirs, or pairing reservoir and pump station construction to increase reservoir turnover.

However, some utilities, such as East Bay Municipal Utility District and Contra Costa Water District, have also considered reducing storage criteria for emergency and operational storage, based on water quality concerns. East Bay Municipal Utility District has an adopted policy of providing 150 percent of maximum day demand for operational and emergency storage, but now reviews new reservoir sizing on a case-by-case basis. Contra Costa Water District requires 100 percent of maximum day demand for operational (25 percent) and emergency (75 percent) storage; however, the district is providing standby power at key pump stations to meet emergency service goals from a combination of storage and pumping, for the near-term, while retaining the long-term goal of providing emergency storage equal to 75 percent of maximum day demands.

The City of Pleasanton has experienced problems with total chlorine residual during late summer months in recent years. A water quality analysis (Montgomery Watson, 1998) concluded that part of the problem was attributed to inadequate turnover at the City's Sycamore, Tassajara and Foothill Reservoirs within the Lower zone. Each reservoir has about 8 million gallons (mg) of storage. Of the three, Foothill Reservoir and Sycamore Reservoir have an adjacent pump station that can force turnover in the reservoir. In CDM's experience with other utilities, water quality problems are most likely to occur when reservoirs do not have adjacent pump stations to force turnover, or in smaller pressure zones, where fire flow reserves represent the majority of zone storage, and demand is small relative to the total storage volume.

## Storage Sizing Criteria Comparison

Table 5-1 summarizes the City of Pleasanton's storage sizing criteria and compares them with several Bay Area utilities. The City of Pleasanton storage sizing criteria are less conservative than most utilities interviewed. Storage sizing is 75 percent of maximum day demand plus fire storage, compared with a more typical requirement of at least 100 percent of maximum day demand plus fire storage. In comparing with local utilities, Dublin-San Ramon Services District also uses 75 percent of maximum day demand plus fire storage, while City of Livermore uses a slightly more conservative criterion of 100 percent of maximum day demand plus fire storage.

Of the water utilities reviewed, none requires sizing storage reservoirs for multiple simultaneous fires. Although many of the utilities listed have urban wildland interface issues, similar to those of Pleasanton, none have adopted multiple fire flows per zone as a criterion for determining storage requirements. Utilities, such as Marin Municipal Water District and East Bay Municipal Utility District, have focused on pressure zone improvements to improve fire flows in vulnerable areas using land-use based fire flow requirements for a single fire.

## Recommendations for Storage Sizing

The City of Pleasanton's operational and fire storage sizing criteria are consistent with other local utilities. The City's emergency storage sizing component, at 50 percent of maximum day demand, is on the low end of utilities surveyed.

**Table 5-1**
**Distribution Storage Criteria for Various Bay Area Utilities**

| Criterion | City of Pleasanton | Alameda County Water District | Contra Costa Water District | Dublin San Ramon Services District | East Bay Municipal Utility District | City of Livermore | San Francisco Public Utilities Commission | San Jose Water Company |
|---|---|---|---|---|---|---|---|---|
| **SYSTEM STATISTICS** | | | | | | | | |
| **Average Daily Demand** | 11 mgd | Not reported | 39 mgd | 4 mgd | 211 mgd | 5 mgd | 92 mgd | 132 mgd |
| **Number of Reservoirs** | 19 | 11 | 40 | 5 | 165 | 2 | 14 | 91 |
| **Total Storage Capacity (mg)** | 36 MG | 79 MG | 73 MG | 8 MG | 870 MG | 5 MG | 408 MG | 247 MG |
| **STORAGE SIZING CRITERIA** | | | | | | | | |
| **Operational Storage** | 25% of Maximum Day | 40% of Maximum Day | 25% of Maximum Day | 25% of Maximum Day | 150% of Maximum Day, Operational and Emergency Combined. (1) | 50% of Maximum Day | -- | -- |
| **Emergency Storage** | 50% of Maximum Day Demand | 100% of Maximum Day | 75% of Maximum Day | 50% of Maximum Day | | 50% of Maximum Day | -- | -- |
| **Fire Storage** | Dependent on Most Critical Land Use and Fire Flow Duration | -- | Dependent on Most Critical Land Use and Fire Flow Duration | Dependent on Most Critical Land Use and Fire Flow Duration | Dependent on Most Critical Land Use and Fire Flow Duration | Dependent on Most Critical Land Use and Fire Flow Duration | -- | Dependent on Land Use and Fire Flow Duration |
| **Total Storage Volume** | 75% of Maximum Day Demand + Fire Storage | 140% of Maximum Day Demand | 100% of Maximum Day Demand + Fire Storage | 75% of Maximum Day Demand | 150% of Maximum Day + Fire (1) | 100% of Maximum Day + Fire | 400% of Average Day, including fire storage. | 100% of Average Day + fire storage or 100% of Maximum Day, whichever is larger |
| **Facility Sizing or Configuration Affected by Water Quality** | No. | Incorporated into reservoir location and design. | Incorporated into reservoir location and design. | No. | Design considerations of inlet/outlet line configuration | No. | No. | No. |
| **Use Multiple Fires for Storage Sizing?** | No. | Not reported. | No. | No. | No. | No. | No. | No. |

(1) The District recently conducted a review of its facility sizing criteria. While the recommendation from the study was to reduce storage to 100% of maximum day demands, the District has not implemented this District-wide, but is reviewing new facilities on a case-by-case basis.

CDM recommends maintaining the City's current storage sizing criteria of:

- 25 percent of maximum day demand for operational storage.
- 50 percent of maximum day demand for emergency storage.
- Fire reserves based on fire flow for the most critical land use in the zone.

Increasing emergency storage to 75 percent of maximum day demand was considered, but is not recommended for the following reasons:

- The largest impact to zone storage sizing would be in the Lower zone, where the City has experienced low residuals due, in part, to low reservoir turnover at its large storage reservoirs. The Lower zone also has multiple Zone 7 turnouts serving the zone, and groundwater wells, increasing the reliability of supplies to the zone. Additionally, the City's criterion to provide operational storage equal to 25 percent of maximum day demand is somewhat conservative for Lower zone, where calculations indicate that 12 percent of maximum day demand is met from storage.
- Increasing emergency storage in smaller zones would have very little reliability impact, since the majority of storage in these zones is fire reserve storage.

In the future, the City may wish to consider increasing its emergency storage criterion for Lower Zone, due to the City's reliance on imported supply. However, this would need to be weighed with water quality considerations.

## 5.2 Pump Station Sizing

For zones with operating storage to meet peak hour needs, pump stations are generally designed for the average flow on the maximum demand day, with the largest unit available as a standby, except where agencies implement time-of-use pumping to reduce electricity costs. The City of Pleasanton operates pump stations on time-of-use electric rate schedules and sizes pump stations to provide 150 percent of maximum day demand over a 16-hour period, which is equivalent to pumping average maximum day demand over the course of the day.

Of the local utilities reviewed, only East Bay Municipal Utility District, San Jose Water Company and City of San Francisco use sizing criteria more stringent than providing pumping capacity higher than 100 percent of maximum day demand. East Bay Municipal Utility District has an adopted policy of providing 150 percent of maximum day demand for pump station sizing based on time-of-use operation, but now reviews new pump station sizing on a case-by-case basis. San Jose Water Company sizes pump stations for 8 to 10-hour pumping, to re-fill storage during the length of one work shift. The City of San Francisco sizes pump stations for 12-hour pumping on the maximum demand day.

### Recommendations for Pump Station Sizing

CDM recommends that the City size pump stations to meet 150 percent of maximum day demand with the largest unit available as a standby.

## 5.3 Valve Station Sizing

The City has several smaller zones in its hillside areas that are served by pressure reducing stations. Stations are sized to include two small valves (typically 2-inch diameter) and one large valve (6-inch or 8-inch) that together that are capable of meeting peak hour demands on the maximum day and fire flows within the zone. CDM recommends continuing to use this sizing criterion.

## 5.4 Distribution Pipelines

Distribution pipeline criteria are typically expressed in system pressures, head loss or velocity considerations to be taken into account in determining deficiencies in existing pipelines or in sizing new pipelines. Table 5-2 compares distribution system criteria for the local water utilities reviewed. The City's pressure requirement of 30 psi under peak hour conditions is on the low end for pressure criteria. Other pressure criteria are consistent with other water utilities.

***Table 5-2***
***Distribution Pipeline Criteria for Various Bay Area Utilities***

| *Criterion* | *City of Pleasanton* | *Alameda County Water District* | *Contra Costa Water District* | *Dublin San Ramon Services District* | *East Bay Municipal Utility District* | *City of Livermore* | *San Francisco Public Utilities Commission* | *San Jose Water Company* |
|---|---|---|---|---|---|---|---|---|
| **SYSTEM STATISTICS** | | | | | | | | |
| **Average Daily Demand** | 11 mgd | | 39 mgd | 4 mgd | 211 mgd | 5 mgd | 92 mgd | 132 mgd |
| **Number of Pressure Zones** | 15 | 17 | 26 | 3 | 122 | 3 | 27 | 66 |
| **SYSTEM PRESSURE CRITERIA** | | | | | | | | |
| **Minimum Service Pressure, Normal Operations** | 30 psi, peak hour; 40 psi maximum day | 40 psi | 40 psi | 50 psi average day; 50 psi maximum day; 40 psi peak hour. | 30 psi | 35 psi, peak hour | 25 psi | 30 psi, peak hour; 40 psi maximum day |
| **Minimum Service Pressure, Fire Flow** | 20 psi | 20 psi | 20 psi | 20 psi | 20 psi | 20 psi | 20 psi | 20 psi |
| **SYSTEM PIPELINE CRITERIA** | | | | | | | | |
| **Maximum Velocity** | -- | | 10 ft/sec peak hour; 12 ft/sec maximum day plus fire | 5 fps average day; 7 fps max day; 8 fps peak hour; 12 fps fire flow. | 10 ft/sec | 12 ft/sec | 4 feet/second gravity zones; 8 feet/second pumped zones. | 5 feet/sec at pump stations; 10 ft/second peak hour; 15 ft/sec fire flow |
| **Maximum Headloss** | -- | | 10 ft/1000 ft, non fire flow conditions. No criteria for fire flow conditions. | 3 ft/1000 ft average day; 5 ft/1000 ft max day; 7 ft/1000 ft peak hour; 10 ft/1000 ft fire flow | 10 ft/1000 ft | 10 ft/1000 ft | -- | -- |

Much of the City's new development is in hillside areas where units are sprinklered. In the past, the Livermore-Pleasanton Fire Department has expressed concern that adequate pressure be provided in sprinklered areas. In reviewing fire flow requirements with the fire department, CDM has proposed that new service areas (at higher elevations, not infill), have a minimum service pressure requirement of 40 psi rather than 30 psi.

Although the City of Pleasanton has historically used only pressure-based criteria, most utilities include head loss and velocity considerations as well as pressure considerations. Some utilities consider head loss or velocity for normal operations only, without fire flows. Other utilities use head loss and velocity sizing criteria only for sizing new facilities. In other words, existing system pipelines that do not meet these criteria would not be considered deficient.

Typically, high velocities and/or high head losses may manifest themselves in a reduction in pressure. However, high velocities are also a concern for water hammer. The American Water Works Association's Manual M32 – "Distribution Network Analysis for Water Utilities" (AWWA, 1989) notes that, "Velocities in pipe segments are acceptable up to about 10 feet/second. However, as velocities increase, pipe head losses increase exponentially and problems with water hammer develop. Generally, as velocities approach 5 feet/second, pipes become limiting factors in delivering water at acceptable pressure to the extremities of the system."

Although water hammer could be a risk during a fire, with the most likely cause from rapid closure of a hydrant following use, requiring new facilities for this infrequent scenario was not deemed to be warranted.

## Recommendations for Distribution System Criteria

CDM recommends the following pressure, velocity and head loss criteria for pipeline sizing:

- Use current pressure criteria of 40 psi for maximum day demands, 30 psi for peak hour demands, and 20 psi for maximum day demand plus fire flow for existing pressure zones.
- For new pressure zones, or new development at higher elevations in existing pressure zones, use 50 psi for maximum day demands, 40 psi for peak hour demands and 30 psi for maximum day demand plus fire flow.
- Adopt a velocity criterion of 5 feet per second, maximum velocity for non-fire flow conditions only for new development.
- Adopt a head loss criterion of 10 feet per 1000 feet for non-fire flow conditions only, for new development.

Pressure criteria were used for checking existing pipelines and sizing new pipelines.

Velocity and head loss criteria were used as a guide for sizing new pipelines. Existing pipelines not meeting velocity and head loss criteria were only judged deficient if they also resulted in pressure problems or other operational problems.

## 5.5 Fire Flow Criteria

Fire flow criteria for the City of Pleasanton were reviewed in a meeting on April 24, 2001 with Eric Carlson, Fire Marshal for the Livermore-Pleasanton Fire Department. These fire flows were subsequently documented in a letter from the City of Pleasanton to Mr. Carlson on July 26, 2001. Table 5-3 summarizes these fire flow requirements.

***Table 5-3***
***Fire Flow Criteria for Water Master Plan***

| ***Land Use Description*** [1] | ***Flow (gpm)*** |
|---|---|
| Single-family residential | 1500 (1000 if sprinklered) |
| Multi-family residential, single-story | 2000 (1500 if sprinklered) |
| Multi-family residential, two-story | 2500 (2000 if sprinklered) |
| Multi-family residential, three or more stories | 2500 |
| Schools, commercial, hospitals | 3500 |
| Industrial [2] | 4000-5000 |

(1) All fire flows are at 20 pounds per square inch (psi) residual pressure and 2-hour duration.
(2) City of Pleasanton and Fire Marshal to identify requirements and locations for specific industrial customers.

Typically, master planning evaluations for fire flow assume one fire at any given time in a pressure zone, except in larger pressure zones. Contra Costa Water District uses a criterion of two simultaneous fires, one commercial and one residential, in its largest pressure zone. Based on discussion and review with the City of Pleasanton, a criterion of two simultaneous fires was used for the Lower zone, with one fire applied in Hacienda Business Park, and a second fire applied in the adjacent residential area within the zone.

## 5.6 Water Quality Criteria

Many master planning evaluations incorporate water quality modeling of the distribution system. Water quality modeling can encompass a number of areas, including evaluating overall water age within the distribution system, principally driven by reservoir detention times, persistence of chlorine or chloramines residuals, or evaluation of source blends, when customers receive different sources of supply with different water quality characteristics.

Water quality problems, such as loss of disinfectant residual, or nitrification potential are dependent on a number of factors, such as system infrastructure, water chemistry, water age and water temperature. However, water age plays a significant role and provides a general indicator of the potential for water quality problems. Often, water age modeling is used as a substitute for chlorine or chloramines modeling, since it is

difficult to collect the data required to evaluate chlorine or chloramines interactions with the distribution system.

For this master planning effort, both water age and source blends were evaluated.

### Water Age

As noted above, water age can be a general indicator for other water quality problems, such as loss of disinfectant residual, or potential for nitrification. Therefore, water age is used for screening purposes, to indicate reservoirs with higher potential for water quality problems, based on higher water age. The hydraulic model calculates average water age, assuming that reservoirs are completely mixed.

A water age of 10 days at average day demand conditions is recommended as a target age, based on preliminary evaluations using the hydraulic model to identify calculated water ages at reservoirs where the City has experienced low turnover and operational solutions. Since water age is considered only a general indicator of potential water quality problems, CDM recommends that the City take into account operational experience in prioritizing and implementing water quality improvements to improve reservoir turnover and reduce water age.

### Source Blends

The City has a general goal of serving water of similar quality to all customers. Typically, water hardness concentrations vary depending on the amount of surface or groundwater customers receive, with well water having a higher hardness. The City's Year 2001 Water Quality report indicates that surface water sources have a hardness of about 120 mg/l while well water has a hardness of about 320 mg/l. The City receives a blend of well water and surface water from Zone 7. Zone 7 is currently considering the use of de-mineralization facilities at wells to reduce water hardness.

For the master plan, a goal of 150 mg/l hardness was used, to evaluate both the effects of de-mineralization by Zone 7, and the effects of implementing City blending or de-mineralization projects.

## 5.7 Summary of System Performance Criteria

Table 5-4 summarizes the Water Master Plan system performance criteria used for the evaluation.

**Table 5-4**
**Summary of Water Master Plan System Performance Criteria**

| Facility/Description | Performance Criterion |
|---|---|
| **Storage Reservoir Sizing** | |
| Operational Storage Volume<br>Emergency Storage Volume<br>Fire Reserve Volume | 25 Percent of Maximum Day Demand<br>50 Percent of Maximum Day Demand<br>Based on volume required using rate for most critical land use within pressure zone for duration of 2 hours. |
| **Pump Station Sizing** | |
| Firm Capacity for Zones with Storage | 150 Percent of Maximum Day Demand |
| Firm Capacity for Hydropneumatic Zones | Peak Hour or Maximum Day Demand plus fire flow, whichever is larger. |
| **Pressure Reducing Stations** | |
| Total Capacity | Valves sized to meet peak hour demand plus fire flow |
| **Distribution System Performance** | |
| Existing System Minimum Pressure | 40 psi at Maximum Day Demand<br>30 psi at Peak Hour Demand |
| New Pressure Zones or development in new areas [(1)] | 40 psi at Peak Hour Demand |
| Maximum Pipeline Velocity | 10 feet/second under non-fire flow condition |
| Maximum Pipeline Headloss | 10 feet/1000 feet, for non-fire flow conditions |
| **Distribution System Water Quality** | |
| Water Hardness | Hardness of 150 mg/l or less |
| Water Age | Less than 10 days, as a general indicator of potential for nitrification. |
| **Fire Flows** | |
| Number of simultaneous fires | Lower zone: simultaneous commercial and residential fires in northern zone (Hacienda Business Park and adjacent residential area)<br>All other zones: single fire, based on most critical land use |
| Single-family residential | 1500 gpm for 2 hours (1000 if sprinklered) |
| Multi-family residential, single-story | 2000 gpm for 2 hours (1500 if sprinklered) |
| Multi-family residential, two-story | 2500 gpm for 2 hours (2000 if sprinklered) |
| Multi-family residential, three or more stories | 2500 gpm for 2 hours |
| Schools, commercial, hospitals | 3500 gpm for 2 hours |
| Industrial | 4000-5000 gpm for 2 hours |

[(1)] Does not apply to infill development in existing zones.

# Section 6
# Analysis of Existing System

This section provides an overview of the analysis of the City of Pleasanton's water distribution system to identify areas experiencing deficiencies and requiring improvement. First, the section presents the results of an evaluation for required storage and pumping capacity, using the pump and storage reservoir sizing criteria discussed in Section 5. Then the section reviews results of the distribution system evaluation using the hydraulic model developed for the master plan evaluation.

The hydraulic model for the Pleasanton system was developed using information from the City's Geographic Information System. After calibrating and verifying the hydraulic model, the model was used to evaluate system performance for maximum demand day and fire flow scenarios. The section reviews model development and the evaluation to identify system deficiencies for existing and buildout demand conditions. Section 7 discusses specific improvement alternatives that were evaluated to correct deficiencies identified in the existing system analysis.

## 6.1 Capacity Analysis

This section provides an overview of the supply, storage, pumping, and pressure reducing station capacity analysis performed to identify deficiencies in the City's water system. The analysis compares the design supply, storage, pumping, or PRV capacity with the required capacity based on the facilities sizing criteria presented in Section 5.

The deficiencies identified in this section exist "on paper," using the design facility capacity, without regard to actual facility operation. In contrast, the deficiencies identified in Section 6.2 were identified using the hydraulic model, which evaluates how facilities operate within the system. Each way of identifying deficiencies is equally important, and, for the most part, the same deficiencies were identified in each type of analysis.

### Supply Evaluation

The City of Pleasanton's water supplies include groundwater from City-operated wells, and treated surface and groundwater purchased from Zone 7, served through turnouts from the Zone 7 transmission system to the Lower zone and Ruby Hill area.

As discussed in Section 3, while turnouts from the Zone 7 system have a maximum theoretical design capacity of 39 mgd, a variety of constraints limit turnout capacity to a lower capacity. The maximum historic production from turnouts 1 through 5 that serve Lower zone is 26 mgd. Turnout 7 serves the Ruby Hill area, providing supply to the combined Lower and Upper Ruby Hill pump station. Pump station capacity and suction pressure concerns limit the hydraulic capacity of this turnout to about 3,300 gpm (4.8 mgd).

Table 6-1 compares system demand and supplies for the Lower zone and the Ruby Hill area, using maximum turnout capacities based on peak historical use. The table shows that the City has adequate supply capacity currently, though the Ruby Hill system relies on a single turnout and lacks any supply redundancy.

***Table 6-1***
***Comparison of Demand and Supply – Existing and Buildout Conditions***

| *Service Area* | *Zones Included* | *Maximum Day Demand (mgd)* | *1.5 x Max Day Demand (for 16-hr pumping) (mgd)* | *Turnout/Well Capacity* | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | *Pump Station(s)* | *No. of Units* | *Firm Capacity (mgd)* | *Total Capacity (mgd)* | *Deficiency (mgd)* |
| **Existing Conditions** | | | | | | | | |
| **Lower** | Lower | 28.6 | n/a[1] | Wells [2] | 3 | 10.7 | 10.7 | |
| | | | | Turnouts [3] | 4 | 26.0 | 26.0 | |
| | Upper Zones (except Ruby Hill) | 5.8 | n/a[1] | | | | | |
| | **Subtotal:** | 34.4 | | | | 36.7 | 36.7 | 0.0 |
| **Ruby Hill** | Lower Ruby Hill | 1.6 | 2.3 | Turnouts[3] | 1 | 4.8 | 4.8 | |
| | Upper Ruby Hill | 0.8 | 1.1 | | | | | |
| | **Subtotal:** | 2.3 | 3.5 | **Subtotal:** | | 4.8 | 4.8 | 0.0 |
| **Total Demands:** | | 36.7 | 3.5 | **Total Supplies:** | | 41.5 | 41.5 | 0.0 |
| **Buildout Conditions** | | | | | | | | |
| **Lower** | Lower | 34.3 | n/a[1] | Wells [2] | 3 | 10.7 | 10.7 | |
| | Upper Zones (except Ruby Hill) | 9.0 | n/a[1] | Turnouts [3] | 4 | 26.0 | 26.0 | |
| | **Subtotal:** | 43.3 | | | | 36.7 | 36.7 | 6.6 |
| **Ruby Hill** | Ruby Hill Lower | 1.9 | 2.8 | Turnouts[3] | 2 | 4.8 | 4.8 | |
| | Ruby Hill Upper | 2.0 | 3.0 | | | | | |
| | **Subtotal:** | 3.9 | 5.9 | **Subtotal:** | | 4.8 | 4.8 | 1.1 |
| **Total Demands:** | | 47.2 | 5.9 | **Total Supplies:** | | 41.5 | 41.5 | 7.6 |

(1) n/a = not applicable. 16-hour pumping is not applicable to Lower Zone, which is served primarily from gravity turnouts.
(2) Well Capacity = 7400 gpm (10.7 mgd). 2000 gpm (Well 5) + 2200 gpm (Well 6) + 3200 gpm (Well 8).
(3) Turnout capacity = 26 mgd (maximum historical). Capacity of Turnout 6 is not included.

Up to 8 mgd of new supply capacity will be needed by buildout to meet maximum day demand. This supply capacity could be met from either new turnout capacity or a new well, or a combination of the two. A portion of this will be met from Turnout 6, which has been constructed, but is currently not active. This turnout will be used to supply a future pump station being constructed as part of improvements required for the Vineyard Corridor specific plan area.

## Reservoir Evaluation

The City's storage criterion is to provide storage equal to 75 percent of maximum day demands plus fire reserve, as discussed in Section 5.1. Tables 6-2 and 6-3 compare existing storage capacities with the need for storage in each zone.

**Table 6-2**
**Comparison of Storage Capacity and Zone Demand - Existing Conditions**

| Service Area | Zones Included | Maximum Day Demand (mgd) [1] | Maximum Fire Flow Requirement (gpm) [2] | Storage Requirements (mg | | | | Existing Storage (mg) | Storage Deficit (mg) | Storage Surplus (mg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Operation (25% Max. Day) | Emergency (50% Max. Day) | Fire Reserve (mg) | Total Storage Needed (mg) | | | |
| **Lower** | Lower | 28.59 | 4,000 | 7.15 | 14.29 | 0.48 | 21.92 | 21.18[3] | 0.74[3] | - |
| **Dublin Canyon** | Dublin Canyon | 0.22 | 3,500 | 0.06 | 0.11 | 0.42 | 0.59 | 0.65 | - | 0.06 |
| **Moller 770** | Moller 770 | 0.35 | | | | | | | | |
| | Moller Lower | 0.14 | | | | | | | | |
| | **Subtotal:** | 0.49 | 1,500 | 0.12 | 0.24 | 0.18 | 0.54 | 0.60 | - | 0.06 |
| **770** | 770 | 0.33 | | | | | | | | |
| | Foothill 770 | 0.43 | | | | | | | | |
| | Deer Oaks | 0.05 | | | | | | | | |
| | Lower 770 | 0.14 | | | | | | | | |
| | **Subtotal:** | 0.95 | 1,500 | 0.24 | 0.48 | 0.18 | 0.89 | 0.50 | 0.39 | - |
| **510** [4] | 510 | 0.19 | 1,500 | 0.05 | 0.09 | 0.18 | 0.32 | 0.25 | 0.07 | - |
| **Bonde** [5] except Lund Tank Seismic Area | Grey Eagle | 0.12 | | | | | | | | |
| | Bonde | 3.35 | | | | | | | | |
| | **Subtotal:** | 3.47 | 3,500 | 0.87 | 1.74 | 0.42 | 3.02 | 3.14 | - | 0.12 |
| **Lund**[6] | Lund | 0.07 | 1,500 | 0.02 | 0.03 | 0.18 | 0.23 | 1.50 | - | 1.27 |
| **Kottinger Ranch** | Kottinger Ranch | 0.33 | 1,500 | 0.08 | 0.16 | 0.18 | 0.43 | 0.75 | - | 0.32 |
| **Ruby Hill Lower** | Ruby Hill Lower | 1.56 | 3,500 | 0.39 | 0.78 | 0.42 | 1.59 | 1.50 | 0.09[7] | - |
| **Ruby Hill Upper** | Ruby Hill Upper | 0.75 | 3,500 | 0.19 | 0.38 | 0.42 | 0.98 | 1.48 | - | 0.50 |
| Total Demands (mgd): | | 36.61 | | | | Total Storage (mg): | 30.52 | 30.80 | 1.29 | 1.57 |

Notes:
(1) 2001 Maximum Day Demand = 2.2 * Average Day Demand, except in 770 zone and supported zones, Ruby Hill, and new Vineyard development, where Maximum Day Demand = 3.0 * Average Day Demand
(2) All fire flows are assumed to have a 2-hour duration.
(3) Existing storage in Lower zone assumes a capacity of 4.25 MG for Tassajara Reservoir, equivalent to its capacity at 13.5 feet full. 13.5 feet in Tassajara Reservoir corresponds to 30.5 feet in Foothill Reservoir (Overflow level) under static conditions. The full capacity of Tassajara Reservoir is 8.2 MG, so 3.95 MG of capacity is unused.
(4) Kilkare zone is not included in the Master Plan area, so Kilkare zone storage is not shown here.
(5) Lund area is evaluated separately from the remainder of Bonde zone because the two areas are hydraulically isolated from one another, with the exception of one 6-inch connection.
(6) Includes recently constructed Happy Valley Tank.
(7) The City may wish to consider constructing a temporary regulator. The planned Vineyard Hills Reservoir will eliminate this storage deficit.

**Table 6-3**
**Comparison of Storage Capacity and Zone Demand - Buildout Conditions**

| Service Area | Zones Included | Maximum Day Demand (mgd) (1) | Maximum Fire Flow Requirement (gpm) (2) | Storage Requirements (mg | | | | Available Storage (mg) | Storage Deficit (mg) | Storage Surplus (mg) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Operation (25% Max. Day) | Emergency (50% Max. Day) | Fire Reserve (mg) | Total Storage Needed (mg) | | | |
| **Lower** | Lower | 34.32 | 4,000 | 8.58 | 17.16 | 0.48 | 26.22 | 21.18(3) | 5.04(3) | - |
| **Dublin Canyon** | Dublin Canyon | 0.45 | 3,500 | 0.11 | 0.22 | 0.42 | 0.76 | 0.65 | 0.11 | - |
| **Moller 770** | Moller 770 | 0.49 | | | | | | | | |
| | Moller Lower | 0.15 | | | | | | | | |
| | New zone(4) | 0.02 | | | | | | | | |
| | **Subtotal:** | 0.67 | 1,500 | 0.17 | 0.33 | 0.18 | 0.68 | 0.60 | 0.08 | - |
| **770** | 770 | 0.42 | | | | | | | | |
| | Foothill 770 | 0.61 | | | | | | | | |
| | Deer Oaks | 0.05 | | | | | | | | |
| | Lower 770 | 0.18 | | | | | | | | |
| | **Subtotal:** | 1.26 | 1,500 | 0.32 | 0.63 | 0.18 | 1.13 | 0.50 | 0.63 | - |
| **510** | 510 | 0.24 | 1,500 | 0.06 | 0.12 | 0.18 | 0.36 | 0.25 | 0.11 | - |
| **Bonde** (5) | Grey Eagle | 0.12 | | | | | | | | |
| except Lund | Bonde | 3.88 | | | | | | | | |
| | Vineyard Spec. Plan | 0.95 | | | | | | | | |
| | **Subtotal:** | 4.96 | 3,500 | 1.24 | 2.48 | 0.42 | 4.14 | 3.14 | 1.00 | - |
| **Bonde**(5) | Lund (6) | 0.66 | 2,500 | 0.16 | 0.33 | 0.30 | 0.79 | 1.50 | - | 0.71 |
| **Kottinger Ranch** | Kottinger Ranch | 0.57 | 1,500 | 0.14 | 0.28 | 0.18 | 0.61 | 0.75 | - | 0.14 |
| **Ruby Hill Lower** | Ruby Hill Lower | 1.89 | 3,500 | 0.47 | 0.95 | 0.42 | 1.84 | 1.50 | 0.34 | - |
| **Ruby Hill Upper** | Ruby Hill Upper | 2.02 | 3,500 | 0.51 | 1.01 | 0.42 | 1.94 | 1.48 | 0.46 | - |
| Total Demands (mgd): | | 47.03 | | | | Total Storage (mg): | 38.45 | 30.80 | 7.80 | 0.14 |

Notes:
(1) 2001 Maximum Day Demand = 2.2 * Average Day Demand, except in 770 zone and supported zones, Ruby Hill, and new Vineyard development, where Maximum Day Demand = 3.0 * Average Day Demand
(2) All fire flows are assumed to have a 2-hour duration.
(3) Existing storage in Lower zone assumes a capacity of 4.25 MG for Tassajara Reservoir, equivalent to its capacity at 13.5' full. 13.5' in Tassajara Reservoir corresponds to 30.5' in Foothill Reservoir (Overflow level) under static conditions. The full capacity of Tassajara Reservoir is 8.2 MG, so 3.95 MG of capacity is unused.
(4) New zone is between existing 770 & Moller 770 zones, and at a higher elevation. It is assumed to be a hydropneumatic zone with no storage, drawing from Moller 770 zone. Includes Fuller/Frades, Swartz, Joel, and Lemoine-Upper properties.
(5) Lund area is evaluated separately from the remainder of Bonde zone because the two areas are hydraulically isolated from one another, except through an existing 6-inch diameter connection.
(6) Includes the recently constructed Happy Valley Tank.

Based on this criterion of providing storage equal to 75 percent of maximum day demand alone, and without considering the modeled operational behavior of the reservoirs, the tables identify the following storage deficiencies under existing and buildout conditions:

- Lower zone has a small storage deficit under existing conditions (0.74 mg of 21.92 mg needed), resulting from the inability to fill Tassajara Reservoir. Under buildout conditions, the storage deficit grows larger (5.04 mg) than the unused capacity of Tassajara Reservoir, which was estimated to be 3.95 mg. The unused capacity of Tassajara was estimated by assuming that it could not be filled higher than the Foothill Reservoir overflow elevation (504.5 ft overflow elevation = 13.5 ft in Tassajara Reservoir = 4.25 mg used/3.95 mg unused).

- 770 zone has a large existing storage deficit (0.39 mg of 0.89 mg needed). By buildout conditions, this deficit is 0.63 mg.

- 510 zone has a small existing storage deficit (0.07 mg of 0.32 mg needed). By buildout, this deficit is 0.11 mg.

- Upper Ruby Hill zone, which currently has a storage surplus, will have a buildout storage deficit equal to 0.46 mg of 1.94 mg needed. Of all zones, Upper Ruby Hill zone has the largest projected increase in demand relative to existing demand (169 percent increase). This is due to the number of residential units expected to be constructed.

- Lower Ruby Hill zone has a very small existing storage deficit. By buildout, the deficit is 0.34 mg. Bonde zone has no storage deficit for existing conditions and a storage deficit of 1.00 mg by buildout for the Bonde/Vineyard subarea of the zone. As part of the proposed Vineyard Corridor Specific Plan water system improvements, these two zones will be hydraulically interconnected and the proposed Vineyard Hills Reservoir will be sized to accommodate the deficiency in the Lower Ruby Hill and Bonde/Vineyard zones.

- Storage requirements in 770 and Ruby Hill zones are generally higher than the other zones because of the 3.0 maximum day to average day peaking factor used in these zones, to reflect higher summertime demands due to large irrigation requirements.

## Pumping Evaluation

The City's pumping criterion is to provide firm pumping capacity sufficient to pump the maximum day demand for each zone in 16 hours. Firm capacity is defined as the capacity with the largest pumping unit at the pump station designated as a standby unit. As discussed in Section 5.2, this is equivalent to providing pumping capacity sufficient to pump 1.5 times the maximum day demand. Tables 6-4 and 6-5 compare existing pump station capacities with the required pumping capacity in each zone.

**Table 6-4**
**Comparison of Pump Station Capacity and Zone Demand – Existing Conditions**

| Service Area | Zones Included | Maximum Day Demand (mgd) (1) | 1.5 x Max Day Demand (mgd) | Pump Station(s) | Firm Capacity (mgd) (2) | Deficiency (mgd) | Surplus (mgd) |
|---|---|---|---|---|---|---|---|
| **Dublin Canyon** | Dublin Canyon | 0.22 | 0.33 | Canyon Meadows (3) | 1.4 | - | 1.1 |
| **Moller 770** | Moller 770 | 0.35 | | | | | |
| | Moller Lower | 0.14 | | | | | |
| | **Subtotal:** | 0.49 | 0.73 | Laurel Creek | 1.2 | - | 0.5 |
| **770** | 770 | 0.33 | | | | | |
| | Foothill 770 | 0.43 | | | | | |
| | Deer Oaks | 0.05 | | | | | |
| | Lower 770 | 0.14 | | | | | |
| | **Subtotal:** | 0.95 | 1.43 | Longview | 1.2 | 0.2 | - |
| **510** | 510 | 0.19 | | | | | |
| | Kilkare | 0.16 | | | | | |
| | **Subtotal:** | 0.34 | 0.52 | Foothill 2 | 1.2 | - | 0.7 |
| **Bonde (4)** except Lund | Grey Eagle | 0.12 | | McCloud | 2.7 | | |
| | Kottinger Ranch | 0.33 | | Vineyard | 1.2 | | |
| | Bonde | 3.35 | | | | | |
| | **Subtotal:** | 3.80 | 5.70 | **Subtotal:** | 3.9 | 1.8 | - |
| **Bonde (4)** | Lund | 0.07 | 0.10 | North Sycamore (5) | 3.8 | - | 3.7 |
| **Grey Eagle** | Grey Eagle | 0.12 | 0.18 | Grey Eagle (3) | 0.2 | - | - |
| **Kottinger Ranch** | Kottinger Ranch | 0.33 | 0.49 | Kottinger Ranch | 0.6 | - | 0.1 |
| **Ruby Hill Lower** | Ruby Hill Lower | 1.56 | 2.33 | Ruby Hill Lower | 1.3 | 1.1 | - |
| **Ruby Hill Upper** | Ruby Hill Upper | 0.75 | 1.13 | Ruby Hill Upper | 1.8 | - | 1.6 |

Notes:
(1) 2001 Maximum Day Demand = 2.2 * Average Day Demand, except in 770 zone and supported zones, Ruby Hill and new Vineyard development, where maximum Day Demand = 3.0* Average Day Demand.
(2) Firm Capacity = Capacity with largest pump turned off (except wells). Capacities are based on flowrates as reported by SCADA on 6/21/01.
(3) Capacities for fire pumps at Canyon Meadows and Grey Eagle are not included in capacity analysis.
(4) Lund area is evaluated separately from the remainder of Bonde zone because the two sub-zones operate somewhat independently from one another. Grey Eagle and Kottinger Ranch pressure zones are shown in this zone because they are served from Bonde Zone.
(5) Pump station includes capacity for service to 105 existing single family homes currently served by wells and for the Happy Valley golf course. Demands for these uses are not included in zone demand.

**Table 6-5**
**Comparison of Pump Station Capacity and Zone Demand – Buildout Conditions**

| Service Area | Zones Included | Maximum Day Demand (mgd) (1) | 1.5 x Max Day Demand (mgd) | Pump Station Capacity | Firm Capacity (mgd) (2) | Deficiency (mgd) | Surplus (mgd) |
|---|---|---|---|---|---|---|---|
| **Dublin Canyon** | Dublin Canyon | 0.45 | 0.67 | Canyon Meadows (3) | 1.4 | - | 0.7 |
| **Moller 770** | Moller 770 | 0.49 | | | | | |
| | Moller Lower | 0.15 | | | | | |
| | New zone(4) | 0.02 | | | | | |
| | **Subtotal:** | 0.67 | 1.00 | Laurel Creek | 1.2 | - | 0.2 |
| **770** | 770 | 0.42 | | | | | |
| | Foothill 770 | 0.61 | | | | | |
| | Deer Oaks | 0.05 | | | | | |
| | Lower 770 | 0.18 | | | | | |
| | **Subtotal:** | 1.26 | 1.89 | Longview | 1.2 | 0.7 | - |
| **510** | 510 | 0.24 | | | | | |
| | Kilkare | 0.16 | | | | | |
| | **Subtotal:** | 0.40 | 0.60 | Foothill 2 | 1.2 | - | 0.6 |
| **Bonde (4)** | Grey Eagle | 0.12 | | McCloud | 2.7 | | |
| | Kottinger Ranch | 0.57 | | Vineyard | 1.2 | | |
| | Bonde | 3.88 | | | | | |
| | Vineyard Specific Plan Area | 0.95 | | | | | |
| | **Subtotal:** | 5.52 | 8.29 | **Subtotal:** | 3.8 | 4.5 | - |
| **Bonde (4)** | Lund/Sycamore area | 0.60 | 0.89 | North Sycamore (5) | 3.8 | - | 2.9 |
| **Grey Eagle** | Grey Eagle | 0.12 | 0.18 | Grey Eagle (3) | 0.2 | - | - |
| **Kottinger Ranch** | Kottinger Ranch | 0.57 | 0.85 | Kottinger Ranch | 0.6 | 0.3 | - |
| **Ruby Hill Lower** | Ruby Hill Lower | 1.89 | 2.84 | Ruby Hill Lower | 1.3 | 1.6 | - |
| **Ruby Hill Upper** | Ruby Hill Upper | 2.02 | 3.03 | Ruby Hill Upper | 1.8 | 1.2 | - |

Notes:
(1) 2001 Maximum Day Demand = 2.2 * Average Day Demand, except in 770 zone and supported zones, Ruby Hill and new Vineyard Specific Plan Area development, where Maximum Day Demand = 3.0* Average Day Demand.
(2) Firm Capacity = Capacity with largest pump turned off (except wells). Capacities are based on flowrates as reported by SCADA on 6/21/01.
(3) Capacities for fire pumps at Canyon Meadows and Grey Eagle are not included in capacity analysis.
(4) Lund area is evaluated separately from the remainder of Bonde zone because the two sub-zones operate somewhat independently from one another. Grey Eagle and Kottinger Ranch pressure zones are shown in this zone because they are served from Bonde Zone.
(5) Pump station includes capacity for service to 105 existing single family homes currently served by wells and for the Happy Valley golf course. Demands for these uses are not included in zone demand.

Based on the criterion of providing pumping capacity equal to 1.5 times maximum day demand alone, and without considering the modeled operational behavior of the pumps, the tables identify the following deficiencies:

- In three zones, there is no backup pump capacity (i.e., every pump is needed to meet existing maximum day demand in 16 hours): Bonde zone, 770 zone, and Lower Ruby Hill zone.

- Bonde zone was evaluated as two separate sub-zones – one served by North Sycamore Pump Station and the other one served by Vineyard Pump Station and McCloud Pump Station. These areas are connected by a single 6-inch pipeline, and thereby effectively act as independent zones. The Vineyard and McCloud pump stations have a deficiency of 2.1 mgd under existing conditions and 4.5 mgd by buildout. The North Sycamore PS has surplus capacity of 3.7 mgd under existing conditions and 2.9 mgd by buildout. However, this pump station includes capacity to serve 105 existing single family homes currently served by wells and the Happy Valley golf course, which are not included in existing or future demands.

- 770 zone, which has an existing 0.2 mgd deficit, requires one additional pump to meet the pumping capacity criterion. This unit would also need to meet the projected future deficit of 0.7 mgd.

- Upper Ruby Hill zone will have a 1.2-mgd pumping capacity deficit in the future. Two additional units, equivalent to or smaller than the existing 0.9-mgd units, would be necessary to address this deficit.

## Pressure Reducing Station Evaluation

Four zones are served exclusively by pressure reducing valve (PRV) stations and have no in-zone storage: Moller 770 zone serves Moller Lower zone, while 770 zone serves Foothill 770, Lower 770, and Deer Oaks zones.

Each zone is served by a PRV station consisting of two 2-inch PRV's for normal operations to meet peak conditions and one 6-inch or 8-inch PRV for fire service. Lower 770 zone is served by two valve stations with this configuration. Under normal operation the combined capacity of the valves is available to meet normal deliveries plus fire flows, though typically the smaller valves would be used as duty valves, with the large valve activated only for fire service or during peak demand periods. Table 6-6 compares the total valve station capacity with demands, including fire flows, in the four PRV-supplied zones.[1]

[1] Valve capacity is based on Cla-Val globe-style pressure reducing valve operating at its maximum continuous flowrate.

**Table 6-6**
**Comparison of Pressure Reducing Station Capacity and Zone Demand**

| Zone | Existing Peak Hour Demand Plus Fire (1) (gpm) | Buildout Peak Hour Demand Plus Fire (1) (gpm) | Total PRV Capacity (gpm) | Deficit (gpm) (Timeframe) | Surplus (gpm) (Timeframe) |
|---|---|---|---|---|---|
| Moller Lower | 1,750 | 1,765 | 3,500 | - | 1,735 |
| Lower 770 (serves Foothill 770) | 2,490 | 2,865 | 7,000 (2 valve stations) | - | 4,135 |
| Foothill 770 | 2,240 | 2,560 | 2,200 | 360 | - |
| Deer Oaks | 1,590 | 1,600 | 2,200 | - | 600 |

Table 6-6 shows that existing valve capacities are insufficient in the Foothill 770 zone. One 2-inch valve should be replaced with a 4-inch valve. According to HyDec, the local ClaVal representative, the City currently uses ClaVal model 990 direct acting pressure reducing valves for the small valves. HyDec has recommended that the City replace these valves with diaphragm valves, such as model 90 or 690 valves. CDM concurs with this recommendation. Since these replacements would be made using maintenance and repair funds, replacement of existing valves is not included in the CIP.

# 6.2 Distribution System Evaluation

This section describes the development of the hydraulic model of the City of Pleasanton distribution system and the evaluation of distribution system performance on maximum day under existing and buildout conditions.

## Hydraulic Model Development

The hydraulic model of Pleasanton's water distribution system was developed using facility information from the City's GIS files and summary records of the City's Utility Division, elevation information from an aerial survey flown in 2001, and demand information from the City's water customer billing database. Appendix C contains a detailed description of the procedures used to create, calibrate, and validate the hydraulic model. A brief summary is also provided here.

The model was calibrated using data from fourteen hydrant tests. The purpose of model calibration is to refine the pipeline roughness factors used in the model. Hydrant test data indicated that head losses in ACP pipe were higher than initially assumed, and provided similar insight into other classes of pipe. Following model calibration, there was good agreement between observed pipeline head losses and modeled head losses, except in Dublin Canyon zone, where modeled head losses are higher than system data indicate. No improvements are needed for Dublin Canyon zone, so this difference is not judged to be significant.

To verify the validity of the model, it was used to simulate operating conditions on June 21, 2001, the maximum demand day in 2001. SCADA data from that day were compared with model results for reservoir operation, pump flow rates, and pump suction and discharge pressures. As part of this process, some pump curves were modified to create a better match between SCADA data and the model. Model verification results were good, except at Dublin Canyon and Longview pump stations (see Appendix C). No flows were available from SCADA at the Longview pump station, and there were differences in both modeled and actual suction and discharge pressures. Since pipeline improvements are needed on the discharge side of the pump station, pump station operation should be confirmed as part of the pipeline planning or preliminary design effort.

Following model calibration and verification, CDM integrated Zone 7's transmission system model from the Zone 7 Treated Water Master Plan (2000). The model includes all principal existing transmission facilities, as well as future improvements identified in the Zone 7 Treated Water Master Plan that would be in place by Pleasanton's buildout horizon, assumed to be 2015.

The hydraulic model used for deficiency analysis is a slightly simplified version of the City of Pleasanton's complete water distribution system. The Lower zone pipe network was skeletonized to eliminate small pipes and combine pipes with the same diameter and material type.

Existing and buildout model demands were developed using the City's customer billing database and the City's projections for future growth. Section 4 provides greater detail about the development of demands and peaking factors.

## Hydraulic Deficiency Analysis

A hydraulic analysis was performed to assess distribution system performance and identify system deficiencies. The analysis included the following modeling scenarios to assess system performance:

- Extended period (hour-by-hour) simulations on the maximum demand day, to evaluate system pressures, and reservoir re-fill for existing and buildout demand scenarios.

- Steady-state (snapshot in time) hydraulic evaluations of maximum day demand, with fire flows applied at various locations, to test the system's ability to supply required fire flow for existing and buildout demand scenarios.

This section discusses the operational characteristics and deficiencies identified in each of these scenarios.

## Maximum Day Demand Scenarios for Normal Operations

An extended period evaluation was performed to evaluate distribution system performance on the maximum demand day. CDM met with the City and Zone 7 Operations staff to review system operation. CDM used information from the meetings, along with setpoint information from SCADA, to model system operations based on actual operating conditions. For the evaluation, CDM ran the model for two to three consecutive maximum days to evaluate system operating trends.

System pressures, pump operations and reservoir filling characteristics were reviewed to identify deficiencies such as low pressure problems, standby pumps operating to meet demands, or reservoirs operating down to storage levels normally reserved for emergencies or fires.

Table 6-7 summarizes the water supply assumptions used in the maximum demand day extended period simulation.

***Table 6-7***
***Model Assumptions for Water Supply***
***Maximum Day Demand, Extended Period Simulation***

| Model Scenario | Zone 7 Operation | | | | | City of Pleasanton Operation | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total Demand (mgd) | Supplies (mgd) | | | | Total Demand (mgd) | Supplies (mgd) | | |
| | | Altamont WTP | Del Valle WTP | Patterson Pass WTP | Wells | | City Wells | Zone 7 Turnouts | List of Operating Turnouts |
| Existing | 61 | 0 | 33 | 11 | 16 | 37 | 11 | 26 | 1, 2, 4, 5, 7 |
| Buildout | 101 | 24 | 36 | 20 | 21 | 47 | 11 | 36 | 1 through 7 |

### *Pressure Criteria*

The City's pressure criterion is to provide a minimum of 30 psi under peak hour conditions and an average of 40 psi for maximum day demand conditions for the existing system. All system pressures were higher than 30 psi. A few locations had an average pressure less than 40 psi, all of which have elevations above the normal high service elevation for their respective zones. Table 6-8 identifies the junctions that did not meet the 40 psi average pressure criterion. Figure 6-1 shows the locations of these junctions.

**Figure 6-1**
**System Pressure Deficiencies**

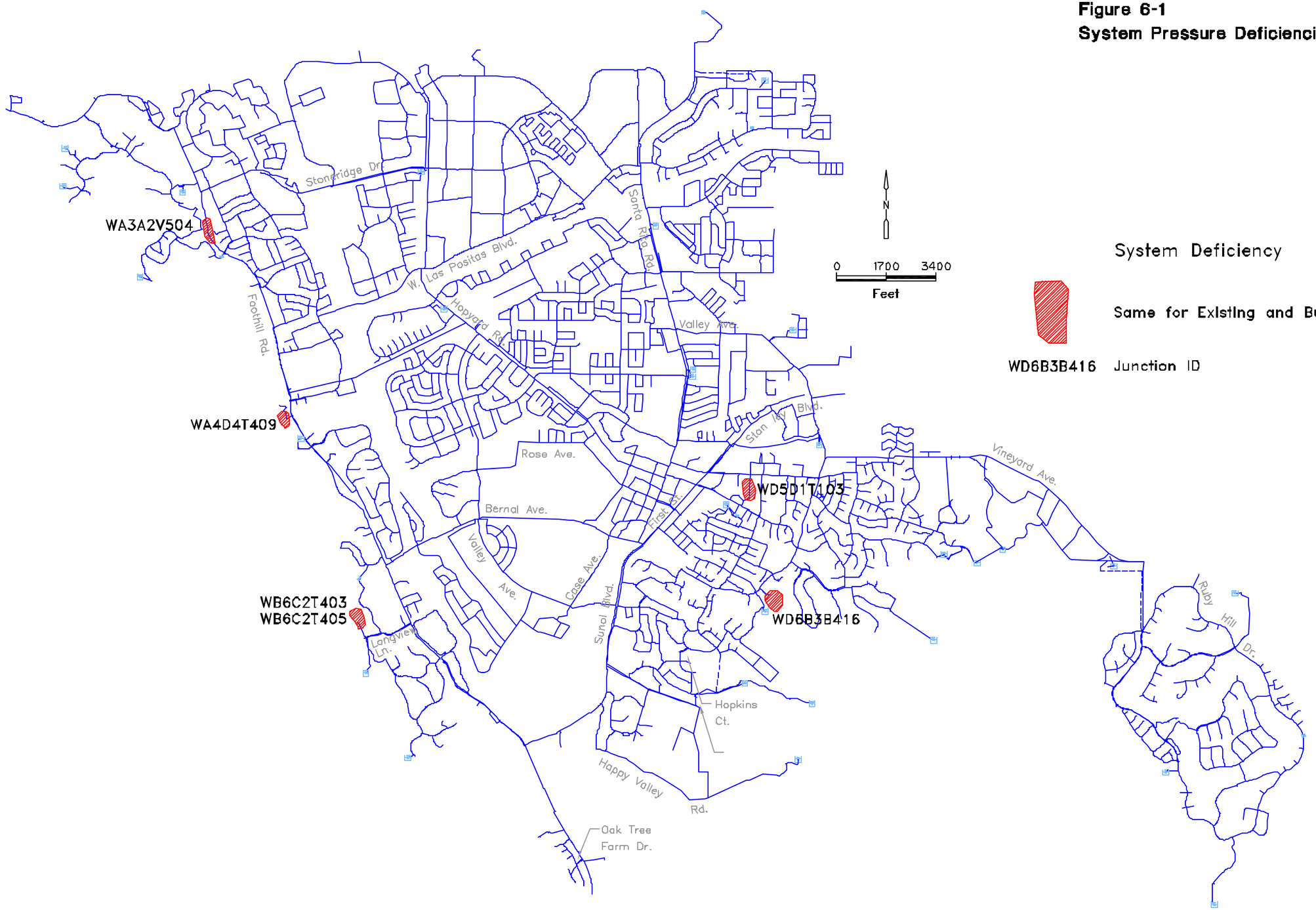


**Table 6-8**
**Service Nodes with Deficient Pressure**

| Junction ID | Elev. (ft) | Zone | Zone High Service Elevation (ft) | Location | Average Pressure (psi) | |
|---|---|---|---|---|---|---|
| | | | | | Max Day Existing | Max Day Buildout |
| WA3A2V504 | 408 | Lower | 390 | Foothill Rd. | 36 | 37 |
| WD5D1T103 | 414 | Lower | 390 | Amador Ct., near McCloud PS | 39 | 39 |
| WA4D4T409 | 458 | 510 | 430 | near 510 Reservoir | 31 | 31 |
| WD6B3B416 | 568 | Bonde | 550 | near Bonde 1 Resv. | 38 | 38 |
| WB6C2T403 | 706 | 770 | 690 | Longview Ln. | 38 | 37 |
| WB6C2T405 | 702 | 770 | 690 | Longview Ln. | 39 | 39 |

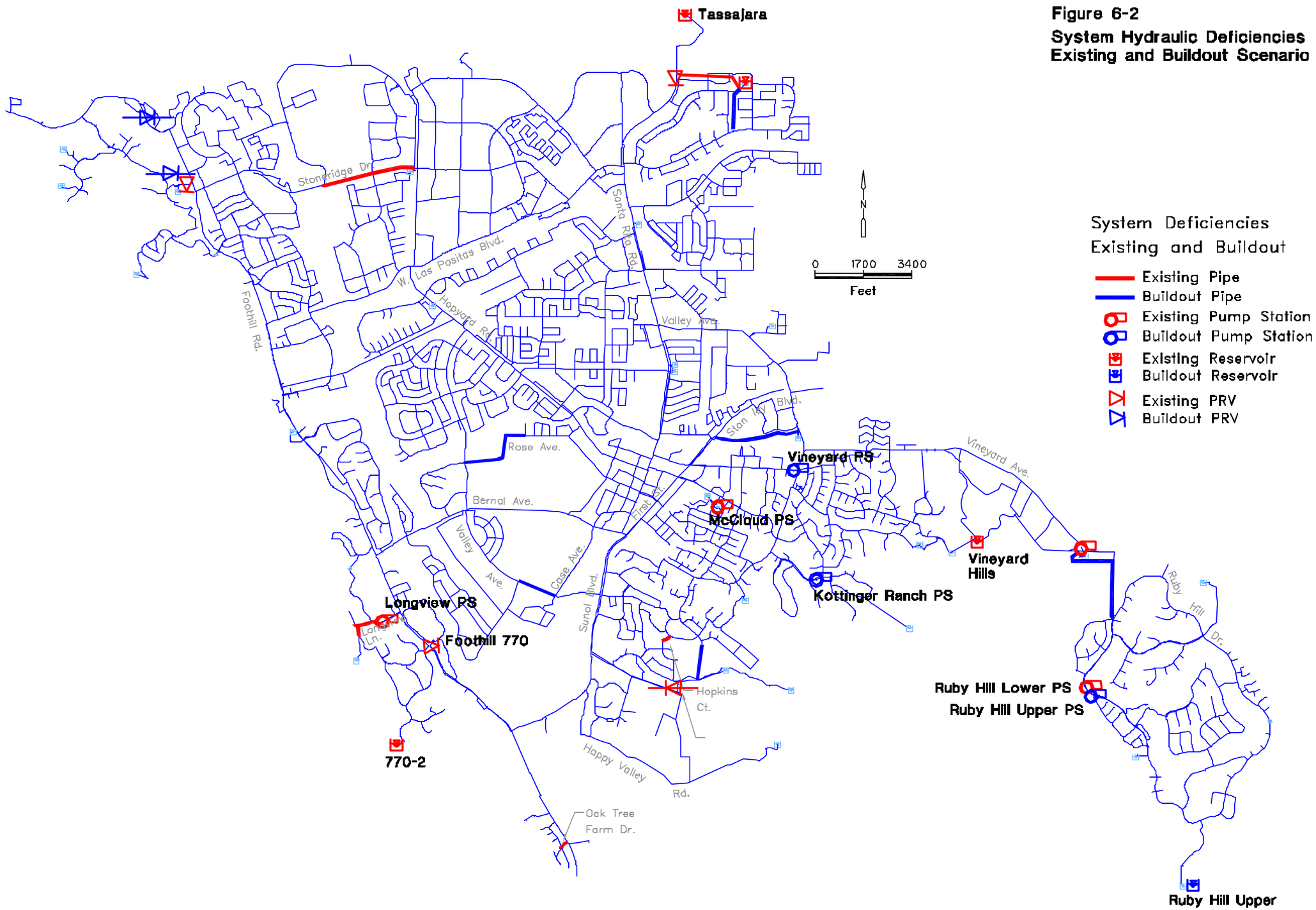
***Reservoir Operation – Existing Conditions***
CDM identified the following reservoir operating problems in the existing maximum day demand scenarios (see Figure 6-2):

- Tassajara Reservoir operates at an average of 22 percent full, and never exceeds 28 percent full.
- Foothill Reservoir averages only 56 percent full.
- 770-2 Reservoir drops to 29 percent full during peak hour demands.

***Reservoir Operation – Buildout Conditions***
The following additional operational issues were identified in the buildout maximum day demand scenario:

- Tassajara Reservoir operation is slightly improved, averaging 53 percent full. This improvement is due primarily to the use of Turnout 3. The turnout was not used in the existing maximum day demand scenario.
- 770-2 Reservoir completely empties during peak hour demands, and 770-1 drops below 35 percent full.
- Bonde-1 Reservoir falls to 61 percent full and Bonde-2 Reservoir falls to 66 percent full during peak hour demands. The new Vineyard Hills Reservoir falls to less than 50 percent full. These problems are symptoms of insufficient pumping capacity and poor hydraulic connection to Lund Reservoir and N. Sycamore pump station more than they are symptoms of insufficient storage, since the City's storage criteria would be satisfied if Vineyard Hills Reservoir were constructed and the hydraulic connection to Lund Reservoir were improved.
- Upper Ruby Hill Reservoir falls to 60 percent full during peak hour demands. The zone has insufficient pumping capacity, which contributes to the problem.

**Figure 6-2**
**System Hydraulic Deficiencies**
**Existing and Buildout Scenario**



***Pump Station Operation – Existing Conditions***
Section 6.3 identifies pumping capacity deficits as established by the City's pumping capacity criteria. These deficits were observed for the existing maximum day demand scenario in the following areas (see Figure 6-2):

- At McCloud, Vineyard, Longview, and Lower Ruby Hill pump stations, the standby unit operates.
- North Sycamore pump station operates an average of only 2.5 hrs/day, while each of the three pumps at McCloud pump station averages 13 hours/day and each of the two pumps at Vineyard pump station averages 15 hours/day.

***Pump Station Operation – Buildout Conditions***
The following additional pump operation issues were identified in the buildout maximum day demand scenario:

- At Kottinger Ranch and Upper Ruby Hill pump stations, the standby unit operates.
- The planned new Vineyard-area pump station at Turnout 6, which was initially sized in the analysis only to meet Vineyard-area demands for the deficiency evaluation, would operate for more than 20 hours per day per pump by buildout.

***Transmission Line Head Losses and Velocities***
The analysis used a head loss criterion of 10 feet/1000 feet of pipe for maximum head losses and maximum velocity criteria of 5 feet/second under normal operating conditions.

The extended period simulation model indicates that high head losses occur in the following areas:

- The 6-inch pipeline section of Longview pump station discharge line (510 ft.) has an average head loss greater than 50 ft/1000 ft.
- Head losses range from 10 ft/1000 ft to 50 ft/1000 ft in the immediate vicinity of Turnout 4.
- The 100 feet of 12-inch pipeline on the discharge side of Well 8 averages more than 3 feet of head loss (30 ft/1000 ft) whenever the pump operates.
- Several of the smaller pipelines surrounding McCloud PS have average head losses above 10 ft/1000 ft.
- The 12-inch diameter pipeline near Turnout 5 shows head losses between 10 and 17 ft/1000 ft.

- There are several small segments of pipes where head losses range from 10 to 15 ft/1000 ft. These pipes are in areas where pressures are above the minimum required pressures.

- Under peak demand conditions all pipes met the velocity criterion of 5 ft/sec.

Only in the case of Longview pump station, which fails to fill the chronically low 770-2 Reservoir, do these high head losses appear to be causing a problem that necessitates pipeline improvements.

### Fire Flow Scenarios

The distribution system was evaluated for its ability to meet maximum day demands with fire flows at critical locations within each pressure zone. CDM selected initial locations by first reviewing critical land uses within each pressure zone, and then identifying higher elevation areas within the land use categories of each zone. After initial selection of fire flow locations, City staff met with the fire marshal to review locations and make adjustments, as needed. For buildout conditions, CDM added eight fire flow locations in areas where development is anticipated. Table 6-9 and Figure 6-3 summarize the forty-two fire flow locations tested.

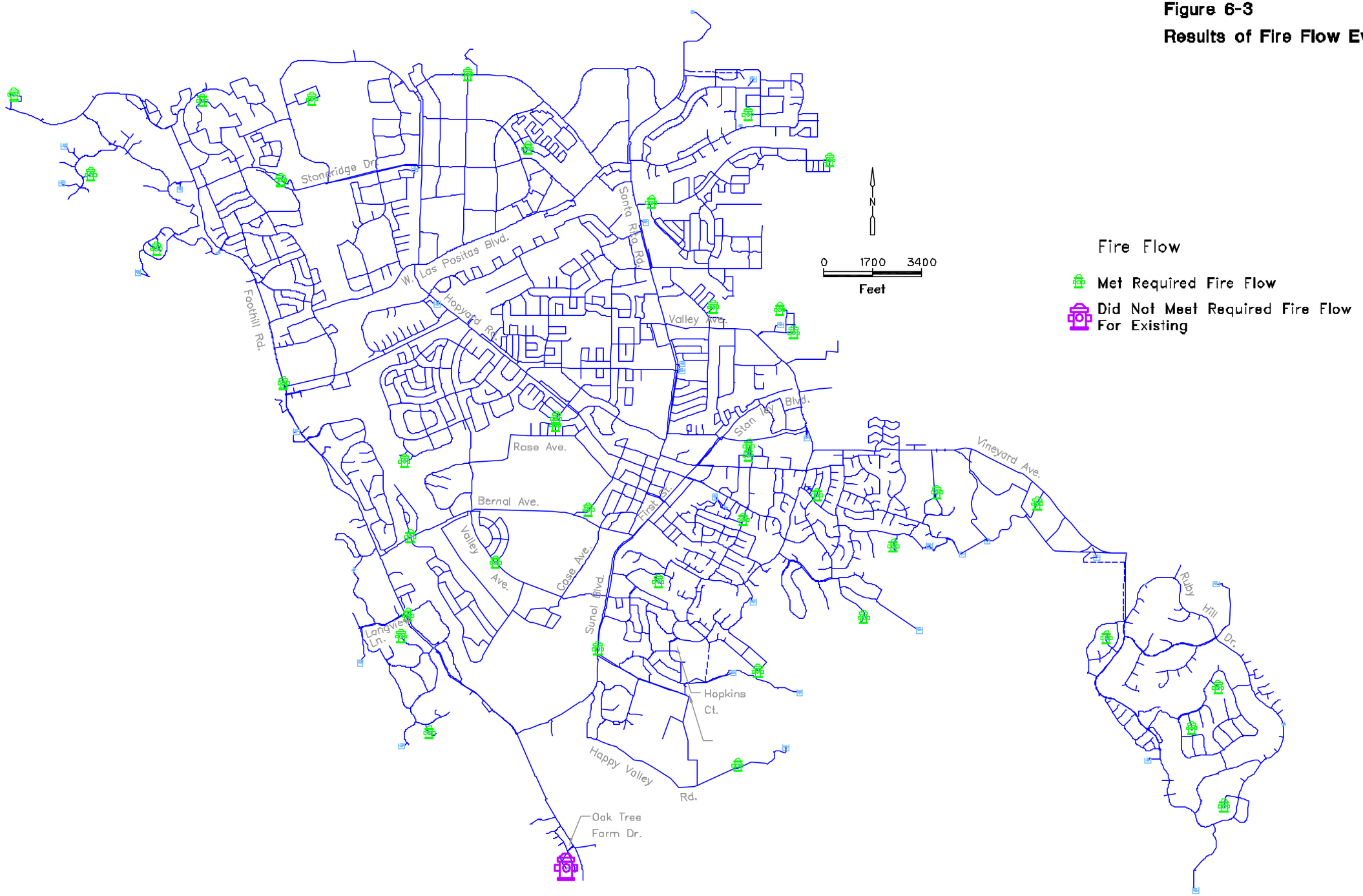
Steady-state (snapshot) simulations were run with average maximum day demands to test fire flow locations. Reservoirs were set to 75 percent full (near the bottom of the normal operating zone storage) and with pumps supplying the zone turned off. In Lower zone, the Zone 7 turnouts were kept open, but the City wells were turned off. Fire flow tests were deemed "passing" if all service nodes in the zone maintained pressures above 20 psi.

Under existing conditions, one fire flow test created pressure deficiencies. Under future conditions, the model indicated there are no deficiencies at different locations than for existing conditions. Table 6-10 summarizes the results of the failed fire flow test. The fire flow location that did not pass is shown in red on Figure 6-3.

**Table 6-9**
**Fire Flow Test Locations for Existing and Buildout Scenarios**

| Junction ID | Location | Zone | Type | Fire Flow Reqt. (gpm) |
|---|---|---|---|---|
| ***Existing Scenario:*** | | | | |
| WE5D1T300 | Foxbrough Pl. | Bonde | Residential Sprinklered | 1,000 |
| WB7D1T501 | Honeysuckle Ct. | 770 | Residential Sprinklered | 1,000 |
| WB6D3Y302 | Cascara Ct. | Lower 770 | Residential Sprinklered | 1,000 |
| WZ2D4T302 | MacDonald Ct. | Moller 770 | Residential Sprinklered | 1,000 |
| WA3C1T106 | Athenour Ct. | Moller 770 | Residential Sprinklered | 1,000 |
| WF6D3T302 | Grappa Pl. | Ruby Hill Lower | Residential Sprinklered | 1,000 |
| WG7A4T200 | Bolla Ct. | Ruby Hill Lower | Residential Sprinklered | 1,000 |
| WG7C1T400 | Pontina Ct. | Ruby Hill Upper | Residential Sprinklered | 1,000 |
| WG8A4T301 | Brindisi Pl. | Ruby Hill Upper | Residential Sprinklered | 1,000 |
| WD4A2T109 | Garatti Ct. | Lower | Residential | 1,500 |
| WD2B3T206 | Portsmouth Ct. | Lower | Residential | 1,500 |
| WB5B3J305 | Corte Monterey | Lower | Residential | 1,500 |
| WE6A2T204 | Navalle Ct. | Bonde | Residential | 1,500 |
| WD6A3T400 | Los Rios Ct. | Bonde | Residential | 1,500 |
| WZ2A2V404 | Canyon Creek Cir. | Dublin Canyon | Residential | 1,500 |
| WC8D3T303 | Fondray Ct. | Foothill 770 | Residential | 1,500 |
| WE6C2T502 | Smallwood Ct. | Kottinger Ranch | Residential | 1,500 |
| WB6D1T514 | Villa Loop | Lower | Multi-Family, single story | 1,500 |
| WA2D4T408 | Street D | Lower | Multi-Family, single story | 1,500 |
| WE2C1T516 | Chocolate St. | Lower | Multi-Family, single story | 1,500 |
| WC2C2T318 | Florian St. | Lower | Multi-Family, multi-story | 2,500 |
| WC4C4T504 | Calle Santa Anna | Lower | Multi-Family, multi-story | 2,500 |
| WD3A1T304 | Stoneridge Dr. | Lower | Multi-Family, multi-story | 2,500 |
| WD5B1T507 | Vine St. | Lower | Multi-Family, multi-story | 2,500 |
| WD5D2T417 | Concord Pl. | Bonde | Multi-Family, multi-story | 2,500 |
| WF6B4T400 | W. Ruby Hill Dr. | Ruby Hill Lower | Commercial | 2,500 |
| WD4B2T103 | Kamp Dr. | Lower | Commercial | 2,750 |
| WF7D2T200 | Romano Cir. | Ruby Hill Upper | Commercial | 2,750 |
| WA2A2T514 | Stoneridge Mall Rd. | Lower | Commercial | 3,000 |
| WD5D3T307 | Mirador Dr. | Bonde | Commercial | 3,500 |
| WA4D2T400 | Foothill Rd. | Lower | School | 3,500 |
| WB2B2T118 | Willow Rd./Owens Dr. | Lower | Commercial | 4,000 |
| WB2A1T507 | Commerce Cir. | Lower | Commercial | 4,000 |
| WC5D3Y103 | County Fairgrounds | Lower | Commercial | 5,000 |
| ***Buildout Scenario:*** | | | | |
| F-ALISAL-115 | Happy Valley Specific Plan Area | Bonde | Residential | 1,500 |
| F-LUND-110 | Lund Ranch | Bonde | Residential | 1,500 |
| F-NOLAN-115 | Nolan Farm | Bonde | Residential | 1,500 |
| F-BERNAL-225 | Bernal Specific Plan Area | Lower | School | 3,500 |
| WD4B2T507 | Busch Rd. | Lower | School | 3,500 |
| V111 | Vineyard Specific Plan Area | Vineyard | School | 3,500 |
| F-BERNAL-100 | Bernal Specific Plan Area | Lower | Commercial | 3,750 |
| WC6D3V501 | Sunol Blvd - Applied Biosystems | Lower | Commercial | 4,000 |

**Figure 6-3**
**Results of Fire Flow Evaluation**



| Table 6-10<br>Location of Fire Flow Deficiency | | | | | | |
|---|---|---|---|---|---|---|
| **Location of Fire Flow (Junction ID)** | **Zone** | **Fire Flow Demand** | **Normal Pressure at Hydrant (psi)** | **Residual Pressure at Hydrant (psi)** | **Lowest Pressure in Zone (psi)** | **Location of Lowest Pressure (Junction ID)** |
| ***Existing*** | | | | | | |
| WC8D3T303 | Foothill 770 | Residential 1500 gpm | 72.88 | 15.74 | 15.74 | WC8D3B305 |

The fire flow demands listed in Table 6-9 were applied separately, as if each fire happened at a different time. CDM also tested Lower zone performance with two simultaneous fire flow demands. The test was performed using 4,000 gpm fire flow demand at Hacienda Business Park *(Junction WB2A1T507)* and 1,500 gpm fire flow demand at a nearby single-story multi-family complex *(Junction WA2D4T408)*. The simultaneous fire flow test did not create any pressure deficiencies in Lower zone.

## 6.3 Water Quality Evaluation

The City of Pleasanton meets distribution system demands from a combination of treated surface water and well water supplied by Zone 7 Water Agency through six turnouts to the Lower zone and City wells, also located within Lower zone. The majority of supply is surface treated water, with wells used to supplement the supply in summer months, during peak demand periods. Zone 7 provides water with a chloramine residual. City wells were retrofitted for chloramine treatment in 2002. As a result, blending of Zone 7 water supply and City wells results in a consistent disinfectant.

Historically, the City has had water quality problems resulting from loss of disinfectant residual. Although some problems have been attributed to uncontrolled blending of chloramines and free chlorine supplies, which can result in rapid loss of disinfectant residual, problems have also been attributed to long detention times in the City's larger reservoirs. Additionally, depending on the combination of supplies, some customers receive predominantly well water, which is significantly higher in salts and hardness. The City has a goal of serving water of similar quality to all customers.

As part of the Master Plan analysis, the hydraulic model was used to perform water quality calculations to evaluate overall water age within the distribution system and water quality blends from the different sources of supply. As discussed in Section 7, information from the water quality evaluation was used to identify improvements, to reduce overall water age, and/or to increase blending of different supply sources, where practicable.

## Water Age Evaluation

As noted in Section 5, a water age of 10 days at average day demand conditions was used as a target age, based on calculated total water ages at reservoirs where the City has experienced low turnover. Reservoirs with higher water ages than 10 days were identified as candidates for capital improvements to improve reservoir turnover.

During lower seasonal demand periods, the City experiences low turnover in several of its distribution reservoirs. This is especially true for reservoirs in smaller pressure zones that have large volumes reserved for fire storage. The City adjusts pump operating set points seasonally to reduce operational volumes in some reservoirs.

CDM used the hydraulic model to evaluate overall water age through the system for average day demands under existing conditions. CDM modeled an average day demand scenario with winter setpoints for pumps. This scenario was selected because an average day scenario is reflective of fall conditions when temperatures are still warm, but demands have dropped. Winter setpoints operate the reservoirs at a lower level to reduce reservoir detention times. The evaluation modeled several hundred hours, simulating several average days in succession to identify water quality trends. Although hydraulic trends are usually evident for a two to three day simulation, water quality modeling requires a much longer simulation time to reveal water quality trends.

Table 6-11 summarizes results of the evaluation, showing average water age in system reservoirs for average day existing conditions. The values shown represent overall water age, including travel through the system and detention in lower zone reservoirs.

Reservoirs with higher water ages were considered candidates for water quality improvements and are shown in bold on Table 6-11. These reservoirs are: Foothill, Sycamore, Tassajara, Lund, Dublin Canyon, 770-2, Moller 770, Laurel Creek, and Ruby Hill Upper reservoirs.

One notable issue is that water ages for all of the Lower Zone reservoirs except Kottinger Reservoir, are very high, indicating that reservoirs have very low exchange rates. For example, Sycamore Reservoir, which operates about 85 percent full, has an average exchange flowrate of 0.15 MGD, resulting in a detention time of 46 days.[2] The only way to significantly improve water ages for these reservoirs is to reduce the operating volumes of the reservoirs. High water ages in these lower zone reservoirs also result in high water ages in higher elevation zones where water is pumped from Lower Zone, such as Moller 770 zone.

[2] Results for Foothill Reservoir show water ages when the reservoir floated on the system, before the altitude valve was repaired.

**Table 6-11**
**Reservoir Cumulative Water Ages**
**under Existing Average Day Demands**

| Zone | Reservoir | Cumulative Water Age (days)[1] |
|---|---|---|
| **Lower** | **Sycamore** | **46** |
| **Lower** | **Foothill** | **40** |
| Lower | Kottinger | 2 |
| **Lower** | **Tassajara** | **42** |
| Bonde | Bonde | 7 |
| Bonde | Bonde 2 | 8 |
| **Bonde** | **Lund** | **21** |
| **Dublin Canyon** | **Dublin Canyon** | **>50** |
| Zone 510 | 510 | 9 |
| Zone 770 | 770-1 | 10 |
| **Zone 770** | **770-2** | **17** |
| **Moller 770** | **Moller 770** | **26** |
| **Moller 770** | **Laurel Creek** | |
| Ruby Hill Lower | Ruby Hill Lower | 4 |
| **Ruby Hill Upper** | **Ruby Hill Upper** | **12** |
| Kottinger Ranch | Kottinger Ranch | 8 |

(1) Water age is cumulative age, taking into account both reservoir detention time and the age of water entering the reservoir.

The water quality analysis showed that Kottinger Reservoir, which has a separate inlet and outlet, has a water age of only 2 days, the lowest in the system. As a result, the Bonde zone which receives fresher water from Kottinger Reservoir also has lower water age than most of the system.

The high water age in Lund Reservoir could be attributed to hydraulic restrictions, which are limiting the water movement in the zone, low demand in the area served by Lund Reservoir, and to the lower turnover in the Sycamore Reservoir in Lower zone.

Water quality improvements were reviewed at reservoirs with water age over 10 days, shown in bold on Table 6-11. Types of improvements include:

- Possible reconfiguration of the inlet and outlet to provide a dedicated suction line from the reservoir to an adjacent pump station (e.g., Foothill reservoir).
- Possible new turnout and reconfiguration of inlet/outlet or re-zoning (e.g., Tassajara Reservoir).
- Installation of bypass valves at existing pump stations or zone gates to bleed water back down from a reservoir to a lower zone (e.g., upper zone reservoirs);
- Operation of reservoirs at lower levels during winter-time, if customer pressures are adequate.

## Blending Evaluation

A water blending analysis of Zone 7 surface water and City of Pleasanton well water was performed for existing average day and maximum day demand conditions to evaluate water quality blends when operating turnouts and wells together. For the analysis, CDM evaluated source blends using water quality data for hardness from the City's Year 2001 Water Quality report, using 110 mg/l hardness for Zone 7 surface water, 320 mg/l for Zone 7 well water and 220 mg/l hardness for turnouts which receive a blend of surface water and well water, and 320 mg/l hardness for City well water. Zone 7 supplies that serve the City of Pleasanton are the Del Valle WTP, located southeast of the City, and Mocho and Hopyard well fields, located in north-central Pleasanton. During winter months, the City typically receives a blend of surface and well water. During summer months, most of the City receives predominantly well water from Zone 7 and City wells.

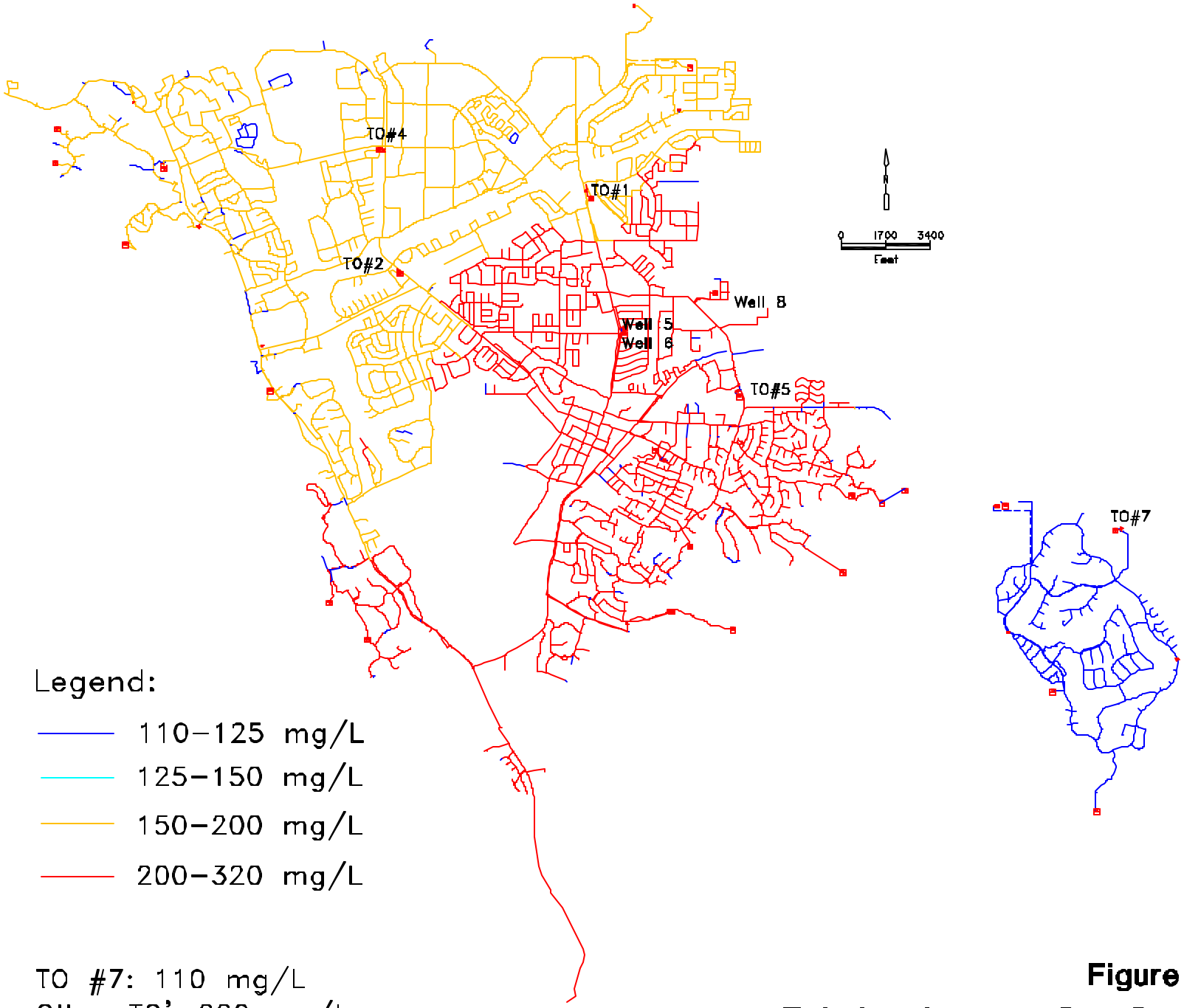
Both average day and maximum day scenarios were evaluated. Table 6-12 summarizes production sources, system demand conditions and water hardness concentrations for the two scenarios.

***Table 6-12***
***Water Supply Sources for Blending Evaluation***

| Scenario | System Demand (mgd) | Supply from Zone 7 (mgd) | Supply from City Wells (mgd) | Wells Used |
|---|---|---|---|---|
| Average Day (1) | 14 | 9 | 5 | 8 |
| Maximum Day (2) | 37 | 26 | 11 | 5, 6, and 8 |

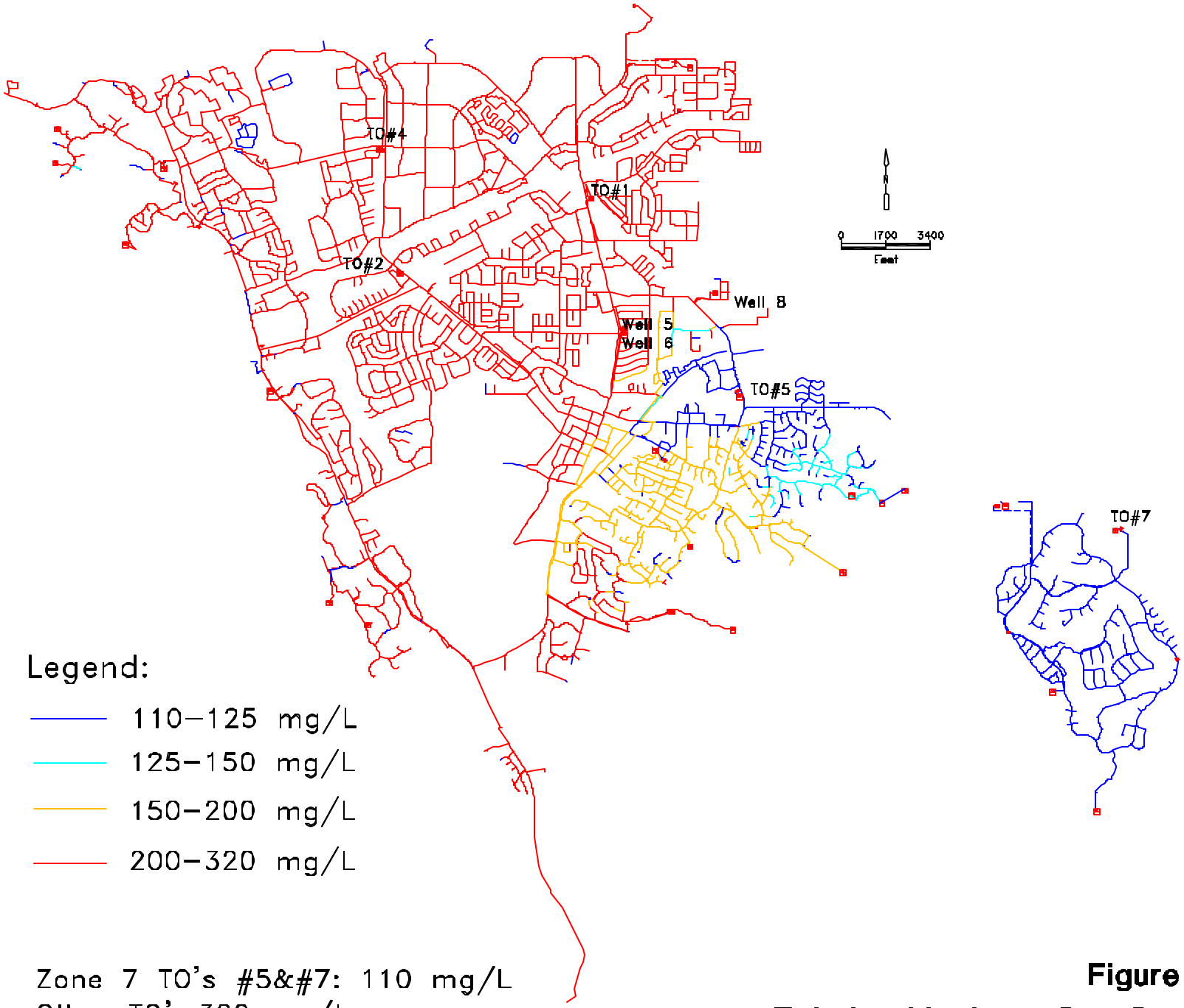
(1) Average Day hardness concentrations: Turnout 7 - 110 mg/l (surface water from Del Valle WTP), and Turnouts 1-5 - 220 mg/l (blend of water from Del Valle WTP and wells). City wells - 320 mg/l.
(2) Max Day hardness concentrations: Turnout 5 and 7 - 110 mg/l ; Turnouts 1-4, City wells - 320 mg/l.

The results of the average day conditions are shown on Figure 6-4, and maximum day conditions are shown on Figure 6-5. As noted above, these figures reflect seasonal differences in deliveries from Zone 7 and higher summer use of City wells. Figure 6-4 shows average day conditions, in which the northern part of the system typically receives a blend of surface and well water, the central part of the system receives mostly well water. Figure 6-5 shows maximum day conditions, with the majority of the system receiving well water. Options for treatment or blending of well water are reviewed in Section 7.




TO #7: 110 mg/L
Other TO's:220 mg/L
City Wells:320 mg/L

**Figure 6-4**
**Existing Average Day Demand**




Zone 7 TO's #5&#7: 110 mg/L
Other TO's:320 mg/L
City Wells:320 mg/L

**Figure 6-5**
**Existing Maximum Day Demand**

# Section 7
# Recommended System Improvements

This section presents recommended system improvements to meet service reliability and water quality goals of the City. The section first reviews the approach to developing improvements and the evaluation of alternatives to meet service reliability and water quality goals. The section concludes with recommended improvements and phasing. Phasing presented in this section identifies whether improvements are required to correct current deficiencies, or are needed to correct deficiencies at buildout conditions. Section 8, which presents the Capital Improvement Program, further prioritizes improvements, to develop a staged improvement program for the City.

## 7.1 Approach for Developing Improvements

CDM evaluated the existing water distribution system for existing and buildout demand conditions and identified improvements to correct deficiencies. Types of improvements include turnouts, pipelines, pump stations, reservoirs and valves. For future growth areas, the analysis focuses on improvements required to convey water through the system to growth areas, but does not look in detail at improvements or system configuration required for developments, since these improvements would be the responsibility of the developer. For example, some future planning areas adjacent to Moller 770 zone will be served from Moller 770 zone, but may require establishment of a new hydropneumatic zone, due to their elevation. The Master Plan evaluates improvements required in Moller 770 zone to deliver water to this area, but does not evaluate specific requirements for the future planning area.

The following assumptions were used in developing capital improvements:

- All pipeline improvements are sized to meet buildout demand conditions.
- Pipeline improvements are sized to conform to standard pipeline diameters: 8, 12, 16, 24 and 30 inches. No improvements were sized less than 8-inch diameter.
- Pump station improvements were sized assuming new units would be of similar size to existing units, where existing pump station expansion is required.
- Some planned improvements from previous studies in the Lower zone were included to provide transmission capacity and improve water quality.

## 7.2 Evaluation of Alternatives

This section summarizes results from the hydraulic and water quality evaluations to determine sizing of improvements.

### 7.2.1 Hydraulic Evaluation

Based on the results of the hydraulic evaluation of the existing system, CDM identified three focus areas for evaluating improvement needs. These areas are:

- The northern portion of Lower zone in and around Tassajara Reservoir;
- 770 zone cascade via Longview Pump Station;
- Bonde, Lower Ruby Hill and Upper Ruby Hill zones.

To address the deficiencies in each area, several options were evaluated. These options are described below.

#### Lower Zone Evaluation

The hydraulic analysis showed that Tassajara Reservoir is operating less than full due to its high elevation in the zone. The available storage volume in the reservoir is 8.2 MG. However only 20 percent to 50 percent of the reservoir volume is used because the reservoir has a higher base and overflow elevation than other Lower zone reservoirs.

Three alternatives were evaluated that make better use of the Tassajara Reservoir. The following three options were evaluated:

- Option 1 – Dedicated Tassajara Reservoir Pipeline and Throttling Valve Station
- Option 2 – Create new Tassajara zone
- Option 3 – New Pipeline and Throttling Valve Station

Alternatives are described in more detail below.

***Option 1 – Dedicated Tassajara Reservoir Pipeline and PRV Station.*** This option would provide a new turnout, dedicated pipeline to the Tassajara Reservoir and include a throttling valve on the reservoir outlet. In this way, Tassajara Reservoir could be operated at a higher level, but pressures in the northern part of Lower zone would be similar to current operating pressures. The following facilities would be required:

- New 5,000 gpm turnout at Pimlico Drive.
- 4,700 feet of new 20-inch pipeline from the new turnout to Tassajara Reservoir, to provide a dedicated inlet pipeline to Tassajara Reservoir from the new turnout.
- 1,800 feet of new 20-inch pipeline from Turnout #3 to new turnout to provide a dedicated inlet pipeline from Turnout #3, for redundancy.

- New 16-inch throttling valve on Tassajara outlet line to reduce head to Lower zone operating gradient of 505 feet.

***Option 2 – Re-zone Tassajara Area of Lower Zone.*** This option would re-zone the Lower zone area served by Tassajara Reservoir. CDM used the City's criterion for sizing zone storage to define the service area for the new zone. The City requires storage to be sized to meet 75 percent of maximum day demand for operational plus emergency needs, and also includes fire storage based on the most critical land use for the zone. Tassajara has a storage capacity of 8.2 MG. Of this, about 7.6 MG is reserved for operational and storage needs, and could support an area with a maximum day demand of about 10 mgd. This corresponds to northern part of the Lower zone bounded by Hopyard Road on the west and the Arroyo Mocho drainage canal on the south. The following facilities would be required:

- New 5,000 gpm to 7,000 gpm turnout at Pimlico Drive.
- 2,000 feet of new 24-inch diameter pipeline to connect the new turnout to the 27-inch pipeline in Tassajara Road.
- New isolation valves to separate the new zone from Lower zone.

***Option 3 – New Pipeline and PRV Station.*** This option is a variation of Option 1, but includes a new pipeline to connect into the inlet/outlet pipeline for the Tassajara Reservoir near the intersection of Santa Rita Rd and Pimlico Drive, rather than requiring a new pipeline all the way to the reservoir. The following facilities would be required:

- New 5,000 gpm turnout at Pimlico Drive.
- 2,200 feet of new 20-inch pipeline to connect the new turnout to the 27-inch diameter pipeline in Tassajara Road to fill the reservoir.
- 1,800 feet of new 20-inch pipeline from Turnout #3 to new turnout to provide a dedicated inlet pipeline from Turnout #3, for redundancy.
- New throttling valve downstream of where the new 20-inch pipeline from the Pimlico turnout connects to the existing 27-inch diameter pipeline in Tassajara Road. This valve would control the flow from the reservoir to the Lower zone.

### Lower Zone Evaluation Findings

Option 1 or Option 3 would allow the City to fill Tassajara Reservoir but would not require re-zoning any of the Lower zone customers. Option 1 would have additional water quality benefits, since all flow from either the new turnout or Turnout No. 3 would be routed through the reservoir, resulting in a low water age in the reservoir. With the configuration for Option 3, only part of the turnout flow would be routed through the reservoir, resulting in higher reservoir water age. However, the

throttling valve will provide flexibility to operate the reservoir at different levels during different times of the year, without affecting customer pressures. Option 3 would also eliminate 2,700 feet of pipeline and does not require a pipeline crossing of Interstate 680. Remote operation of the throttling valve should be provided, so that the City would have more flexibility in controlling operation of the Tassajara Reservoir.

Option 2 would provide a new zone for the Tassajara Reservoir area. With the reservoir re-zoned, the hydraulic evaluation found that the reservoir would operate between 80 and 100 percent full. Current operating pressures in this area exceed 80 psi in some locations. With the re-zoning, operating pressures would be reduced and no customer pressures would exceed 80 psi. However, the analysis found that re-zoning the Tassajara area would increase the customer pressures in the Lower zone, especially in the areas near the City's Zone 7 Turnout 4, on Hopyard Road and Turnout 1 on Santa Rita Road. With the current system configuration, these turnouts supply the Hacienda business park, as well as areas to the south. With a new zone, these turnouts, which would be at the zone boundaries, would no longer supply the Hacienda Business Park area. New transmission improvements would be required to more effectively use these turnouts for the Lower zone.

After reviewing and discussing options, CDM and the City selected Option 3 as the preferred option. Option 2 was rejected because of its adverse impact on customer pressures in the northern part of the Lower Zone. Option 1 was rejected because of the difficulty in crossing highway I-680 and need for longer pipeline.

## 770 Zone and Supported Zones

Longview Pump Station supplies the 770 zone cascade, which includes 770 zone, Lower 770, Deer Oaks and Foothill 770 zone. 770 zone has two storage reservoirs: 770-1 and 770-2. 770 zone supplies Deer Oaks and Lower 770 zones through pressure reducing stations, and Lower 770 zone supplies Foothill 770 zone through a pressure reducing station. The hydraulic analysis identified several deficiencies for this area, including the need for new storage, new pressure reducing station valves, pipeline improvements and pumping capacity. Improvements are required both to correct existing deficiencies, and to provide for new growth, primarily in the 770 and Foothill 770 zones.

Three options were considered for this area. These alternatives are:

- Option 1 – Reinforce Current System and Provide Storage in 770 zone
- Option 2 – Re-zone Foothill 770 to Lower zone
- Option 3 – Reinforce Current System and Provide Storage in Foothill 770 zone

***Option 1- Reinforce Current System and Provide Storage in 770 Zone.*** This option would not change the current system configuration, but would provide new improvements to reinforce the backbone transmission system, with pipeline, pumping and storage improvements in 770 zone. This option includes the following improvements:

- Additional 0.7 mgd of pumping capacity at Longview Pump Station.
- 1,400 feet of new 12-inch diameter pipeline on the discharge side of Longview Pump Station.
- 0.63 MG of new storage in at 770-2 Reservoir.
- Replace existing 2-inch PRV with new 4-inch PRV to serve Foothill 770 to meet peak hour demand.
- Increase lead and lag valve pressure settings at Foothill 770 pressure reducing station by 5 psi to meet fire flow requirements.

***Option 2 - Re-zone Foothill 770 to Lower Zone.*** This option would re-zone Foothill 770 to the Lower zone and provide standby power at Longview PS, to eliminate the need for new pumping and storage improvements in 770 zone. The following facilities would be required:

- 0.63 MG of new storage in Lower zone (in addition to Lower zone requirements)
- Installation of standby power at Longview Pump Station.

***Option 3 - Reinforce Current System and Provide New Storage in Lower 770 Zone.*** This option is similar to Option 1 but provides new storage in Lower 770 zone, rather than 770 zone.

- Additional 0.8 mgd of pumping capacity at Longview Pump Station.
- 1,400 feet of new 12-inch diameter pipeline on the discharge side of Longview Pump Station
- 0.63 MG of new storage in Lower 770 zone.
- Replace existing 2-inch PRV with new 4-inch PRV to serve Foothill 770 to meet peak hour demand

### 770 Zone Evaluation Findings

The findings of the evaluation of the alternatives for zone 770 are summarized below:

- Option 1 would provide improvements consistent with current zone operations. This option has the advantage of consolidating new storage at an existing storage location.

- Option 2 would not provide adequate pressures in the re-zoned area to meet residential fire flows or normal operating pressures for high-elevation customers. Continued use of Foothill 770 pressure reducing station would still be necessary for fire flows. A hydropneumatic station would be required to serve higher elevation customers. The City would prefer not to install new hydropneumatic systems because of additional operating and maintenance requirements associated with these systems.

- Option 3 includes a new reservoir to serve the Foothill 770 zone. The reservoir would need to be located at an elevation high enough to meet all customer pressures, which may require new pressure regulators for some lower-elevation customers. The new reservoir would serve a smaller customer base. Therefore, maintaining water quality would be more difficult than for storage located in 770 zone.

After reviewing and discussing these options, CDM and the City selected Option 1 as the preferred option because it is consistent with current zone operations and consolidates new storage at an existing storage location.

## Bonde-Vineyard Corridor-Ruby Hill Evaluation

The Bonde zone and the Lower Ruby Hill zone have the same customer service elevations but currently are not hydraulically connected. The City is currently working with developers in the area to identify infrastructure requirements for new residential development and a new school in the Vineyard corridor area, located between Bonde zone and Lower Ruby Hill zone. The City will require the developer to install a new pump station at Turnout 6 and a new storage reservoir (Vineyard Hills Reservoir) in the Vineyard corridor area, as well as pipeline improvements for the area to interconnect this area with both Bonde and Ruby Hill zones.

The Master Plan evaluated options for facilities for the Bonde-Vineyard Corridor-Ruby Hill area, considering the developer-planned improvements as a starting point and identifying current or future expansion of these facilities to meet other needs in the area.

New storage and pumping capacity are required for Bonde, Lower Ruby Hill and Upper Ruby Hill Zones by buildout. Under buildout conditions, the storage deficit in Bonde and Lower Ruby Hill zones is 1.34 MG and the pumping deficit is 3.1 mgd. Upper Ruby Hill zone also has a buildout storage deficit of 0.46 MG and a buildout pumping deficit of 1.2 mgd.

The deficiency analysis found that the small suction line from Turnout 7 to Upper and Lower Ruby Hill Pump Stations (these pump stations are housed in the same building) constrains expansion of the pump stations. Additionally, according to the City, site constraints would make building expansion and addition of new pumps difficult, so expansion of the pump station should consider using only available pump slots with larger pumps. An existing 16-inch pipeline connects Turnout No 6 to piping in the Lower Ruby Hill zone. To improve suction pressures at the Lower and Upper Ruby Hill pump stations, this pipeline would be connected to the suction line for the pump stations and a new 16-inch discharge line would be required to connect the Turnout 6 pump station to the Lower Ruby Hill zone.

Two options were considered for pump station and storage improvements for this area:

- Option 1 – New Storage in Vineyard Corridor and Upper Ruby Hill
- Option 2 – New Storage Only in Vineyard Corridor

***Option 1 - Provide New Storage in Vineyard Corridor and Upper Ruby Hill.*** This option provides storage for Ruby Hill Lower and Bonde zone at the proposed Vineyard Hills Reservoir and new storage adjacent to the Upper Ruby Hill reservoir.

- 6.1 mgd of new pumping capacity in Bonde zone.
- 1.34 MG at the proposed Vineyard Hills Reservoir for Bonde zone and Lower Ruby Hill zone.
- 1.2 mgd of new pumping capacity in Upper Ruby Hill zone.
- 0.46 MG in Upper Ruby Hill zone.
- New 16-inch diameter pipeline from Turnout No. 6 Pump Station to Lower Ruby Hill zone.
- New valving to interconnect existing Turnout No. 6 Pipeline to Ruby Hill PS suction pipeline.
- Relocation of 1.2 mgd pumping capacity from Ruby Hill PS to new Turnout 6 PS.

***Option 2 - Consolidate New Storage at proposed Vineyard Corridor Reservoir.*** This option has the same pump station and pipeline improvements as Option 1, but consolidates all Bonde and Ruby Hill zone storage at the proposed Vineyard Hills Reservoir. In order to take advantage of operational storage, water would need to be pumped to meet peak needs at the Upper Ruby Hill Pump Station. Because the pump station is sized for time-of-use operation, there would be sufficient capacity, after

expansion, to meet peak needs through buildout. The pump station also has standby power, so it would be a reliable supply, even in the event of a power outage.

### Bonde-Vineyard Corridor-Ruby Hill Findings

The findings of the evaluation of the alternatives for the combined zone are summarized below:

- Option 1 requires sufficient space for siting a new reservoir in Upper Ruby Hill zone. New storage would be placed at the existing reservoir site, but may require considerable site work. Acquisition of storage elsewhere in the zone would be difficult.

- Option 2 consolidates all storage at the proposed Vineyard Hills Reservoir. Site constraints would require considerable site work to accommodate the larger size reservoir. The hydraulic analysis indicates that in order to evenly distribute zone supplies, the existing Vineyard and McCloud pump stations should each be expanded by one unit, with the remaining capacity located at the new Turnout 6 Pump Station. Water age would likely be an issue when the tank is initially constructed, due to low water demand.

After reviewing and discussing these options, CDM and the City selected Option 1 as the preferred option, because of concerns about water quality issues and extent of site work and costs of a larger Vineyard Hills Reservoir.

As noted above, the Ruby Hill Pump Station, which serves both Lower Ruby Hill Zone (two 1.2 mgd pumps) and Upper Ruby Hill zone (three 0.8 mgd pumps) is a very constrained site, and addition of new pumps would be difficult. One of the pumps serving the Lower Ruby Hill zone would need to be replaced with a new pump for Upper Ruby Hills zone. Therefore, additional capacity to replace the lost capacity to Lower Ruby Hill zone would need to be provided at Turnout 6 Pump Station.

## 7.2.2 Water Quality Improvements Evaluation

As discussed in Section 5, CDM evaluated two aspects of City water quality for the Master Plan Evaluation: 1) overall water age in the system; and, 2) blending of City wells and Zone 7 supply. The age analysis evaluated water age through the distribution system to identify areas with high water age, resulting from reservoirs with high detention times. The improvements analysis focuses on providing improvements that would give operators more flexibility in turning over reservoirs to reduce detention times. The blending evaluation assessed mixing of well water and Zone 7 water. Improvements focus on options to reduce water hardness in general, and to reduce differences in hardness amongst customers.

## Water Age Evaluation

Section 6 reviewed water age in system reservoirs under existing average day demand conditions and identified nine reservoirs with water ages exceeding 10 days. Although water age is only a general indicator, high water ages are indicative of potential water quality problems, such as loss of chloramines residual and increased potential for nitrification. This section compares results from Section 6 with water quality results for buildout average demand conditions with the system improvements identified in the hydraulic analysis. The water quality evaluation also evaluated the effects of repairing the altitude valves at Foothill Reservoir and 770-1 Reservoir. Both of these valves were repaired in 2003. . For reservoirs where water ages are still high, additional water quality improvements are identified.

Table 7-1 summarizes the results of the water quality evaluation for average day existing conditions, with no system improvements, for existing conditions with improvements and for buildout demand, with system improvements.

***Table 7-1***
***Cumulative Reservoir Water Ages under Average Day Demands***

| *Zone* | *Reservoir* | *Water Age (days)* | | |
|---|---|---|---|---|
| | | *Existing System, Existing Demand* | *System with Improvements (1), Existing Demand* | *System with Improvements (1), Buildout Demand* |
| **Lower** | **Sycamore** | **46** | **21** | **12** |
| **Lower** | **Foothill** | **40** | **29** | **15** |
| Lower | Kottinger | 2 | 2 | 2 |
| **Lower** | **Tassajara** | **42** | **21** | **11** |
| Bonde | Bonde | 7 | 7 | 9 |
| Bonde | Bonde 2 | 8 | 8 | 4 |
| **Bonde** | **Lund** | **21** | **12** | **13** |
| **Bonde** | **Happy Valley** | **--** | **--** | **13** |
| **Bonde** | **Vineyard** | **--** | -- | 5 |
| **Dublin Canyon** | **Dublin Canyon** | **>50** | **> 50** | **17** |
| Zone 510 | 510 | 9 | 9 | 4 |
| Zone 770 | 770-1 | 10 | 10 | 5 |
| **Zone 770** | **770-1** | **17** | 10 | 7 |
| **Moller 770** | **Moller 770** | **26** | **33** | **17** |
| **Moller 770** | **Laurel Creek** | **29** | **33** | **17** |
| Ruby Hill Lower | Ruby Hill Lower | 4 | 4 | 3 |
| **Ruby Hill Upper** | **Ruby Hill Upper** | **12** | 12 | 6 |
| Kottinger Ranch | Kottinger Ranch | 8 | 8 | 6 |

(1) Existing improvements include repair of Foothill altitude valve (already implemented) and pipeline improvement to Foothill Reservoir. Buildout scenario includes all planned improvements.

Table 7-1 shows in bold the reservoirs with higher water ages under existing conditions using the current system configuration. The fourth and fifth columns of the table show water ages for existing conditions with the Foothill Reservoir improvements (altitude valve repaired, and new pipeline in Stoneridge Drive), and

under buildout conditions with all recommended improvements, except blending improvements. Lower zone reservoirs show some improvement with the re-configured Foothill Reservoir, and further improvement under buildout conditions when demands are somewhat higher relative to storage volumes. However, in contrast to the Lower Zone, Moller 770 and Laurel Creek Reservoirs show somewhat higher water ages, because they received a blend of system water and Foothill Reservoir water prior to the repair of the altitude valve, but now see only water from Foothill Reservoir.

Although most of the reservoirs that have very high water ages under existing conditions still have water ages higher than 10 days under buildout conditions, the results are much improved due to increased demand relative to storage, as well as the proposed system improvements and configuration.

In addition to configuration changes, CDM also evaluated the feasibility of operating reservoirs at lower levels to reduce overall water volumes and thereby decrease overall water age. As noted previously, Lower zone, which has the largest reservoir volumes, also has areas where wintertime pressures are at or slightly below 40 psi. Therefore, operation of Lower Zone reservoirs with reduced volumes was not evaluated. The analysis focused on lowering pump setpoints for pump stations with standby power, where fire supply could be met from a combination of pumping and storage even during a power outage. Set points were selected that would still provide adequate pressures in the zone while operating the reservoir at a lower level. Table 7-2 summarizes current and revised pump set points for the pump stations with standby power, and the water age reductions achieved by lowering reservoir volumes.

***Table 7-2***
***Reductions in Reservoir Water Age with Lower Operating Setpoints***

| Pump Station | Current Setpoints (ft) | Revised Setpoints (ft) | Reservoir | Water Age with Current Setpoints | Water Age with Revised Setpoints |
|---|---|---|---|---|---|
| Laurel Creek | 8-13 | 5-10 | Laurel Creek | 33 | 27 |
| Foothill 2 | 10-16 | 5-10 | 510 Tank | 9 | 4 |
| McCloud<br>Vineyard (1) | 8-13<br>9-14 | 5-10<br>5-10 | Bonde-1<br>Bonde-2 | 7<br>8 | 5<br>5 |
| Canyon Meadows | 8-13 | 5-10 | Dublin Canyon | >50 | >50 |
| Ruby Hill | 9-14 | 6-11 | Ruby Hill Lower | 4 | 3 |
| Ruby Hill | 9-14 | 6-11 | Ruby Hill Upper | 12 | 7 |

(1) Although Vineyard PS does not have standby power, it was included in the evaluation because McCloud PS, which also serves the same zone, has standby power.

As the table indicates, revising setpoints generally reduces water age anywhere from 1 to 5 days. Dublin Canyon Reservoir, which essentially provides fire storage, is the exception, where water age is still extremely old. The analysis indicates that lower setpoints further in zones where pump stations have standby power is another tool

that operators can use to improve wintertime water quality without compromising customer service. However, results also indicate that long detention times in Lower Zone reservoirs significantly affect overall system water age, and customer pressures in higher elevation areas of the zone may limit operator flexibility to cycle reservoir.

For upper zone reservoirs, where demand is generally small relative to zone storage, CDM recommends the installation of a bypass valve either at the pump station that supplies the zone, or at a zone gate connection to the lower zone. The bypass valve, typically a hydraulically actuated pressure reducing valve with solenoid open-close capability, could be opened by operators to artificially increase the demand on the reservoir to draw down the reservoir. Although water ages could also be reduced by operating the reservoir at a lower level or operating the pump station less frequently to draw down the reservoir, bypass valves have the advantage of giving operators more control and flexibility in how they manage zone operations. The advantage of locating these at pump stations, is that the valves can be tied into the existing SCADA system and remotely operated through SCADA. Bypass valves are recommended at the following locations:

- North Sycamore Pump Station (Lund and Golf Course Reservoirs)
- Laurel Creek Pump Station (Laurel Creek and Moller 770 Reservoirs)
- Canyon Meadows Pump Station (Dublin Canyon)

### Water Blending Evaluation

Section 6 presented results of a blending evaluation to assess the distribution of City well water and Zone 7 water in the City's system. The analysis evaluated water hardness, as $CaC0_3$, using 90 and 320 mg/l for Zone 7 source water (assumes surface water or well water) and 320 mg/l for City wells for average day and maximum day demand conditions with one to three City wells in service. The City typically operates wells year-round, with one well operated during lower demand periods and up to three wells operated during peak conditions. The analysis indicates that blending is limited in areas of Central Pleasanton. Customers in this area receive predominantly well water, with hardness of 250 mg/l or higher (see Figure 6-4 and 6-5).

Three scenarios were evaluated that encompass the range of alternatives that could be implemented to reduce overall hardness for Pleasanton customers. These scenarios are:

- Scenario 1: Water hardness of 90 mg/l for Zone 7 source water and 320 mg/l for City wells. This scenario assumes that Zone 7 implements planned de-mineralization of well water.
- Scenario 2: Water hardness of 90 mg/l for Zone 7 source water and 150 mg/l for City wells, assuming that the City also implements de-mineralization, using reverse osmosis treatment, of well water.

- Scenario 3: Water hardness of 90 mg/l for Zone 7 source water and 320 mg/l for City wells, with pipeline improvements to blend turnout water and well water before introduction to the distribution system. Pipeline improvements used for the scenario assume that Well 5 would be blended with Turnout 2, Well 6 would be blended with Turnout 5, and Well 8 would be blended with a new Turnout 8, located near the well.

All three scenarios include Tassajara and Foothill Reservoir improvements.

Figure 7-1 shows results for Scenario 1, with de-mineralization treatment of Zone 7 source water. The figure indicates that most of central Pleasanton receives predominantly well water, or a blend of well water, with hardness concentrations ranging from 150 mg/l to 320 mg/l.

Figure 7-2 shows results for Scenario 2, with de-mineralization treatment of City wells. Under this scenario, the City would meet its goal of providing water of 150 mg/l hardness or less to all City customers.

Figure 7-3 shows results for Scenario 3, with pipelines to blend wells with turnout water before introducing water into the system. The analysis found that it is not possible to achieve a blend that meets the hardness goal of 150 mg/l and maintains system hydraulics – this scenario achieves a blended hardness of about 180 mg/l.

To compare Scenarios 2 and 3, capital and operating cost estimates were developed, assuming de-mineralization to 180 mg/l, so that costs for the two scenarios represent the same blending objective. Costs for demineralization using reverse osmosis treatment incorporate both capital and operating costs. Other issues that could impact costs and/or project implementation, such as brine disposal options, electrical power requirements and dilution of brine, would need to be considered in a more detailed evaluation of this option.

Capital and operating cost estimates were compared for the two options. Table 7-3 summarizes capital, operating and life-cycle costs for the two options.

***Table 7-3***
***Cost Comparison for Demineralization Treatment and Pipeline Blending Alternatives***

| *Option* | *Capital Cost ($million)* | *Operating Cost ($million)* | *Lifecycle Cost[3]) ($million/yr)* | *Unit Cost ($/MG)* |
|---|---|---|---|---|
| Demineralization | 13.8[1] | 0.5 [2] | 1.4 | 1,300 |
| Pipelines | 5.0 | 0.0 | 0.4 | 320 |

(1) Demineralization capital costs: $1.4/gpd of well capacity ($2.8/gpd of treatment capacity, assuming 50% blend).
(2) Operating costs include power, chemicals, membrane replacement and labor (1 full-time operator). Production assumed at 3,500 af/yr, based on City annual production allowance for well water.
(3) Lifecycle costs estimated assuming 7% financing over 50 years.

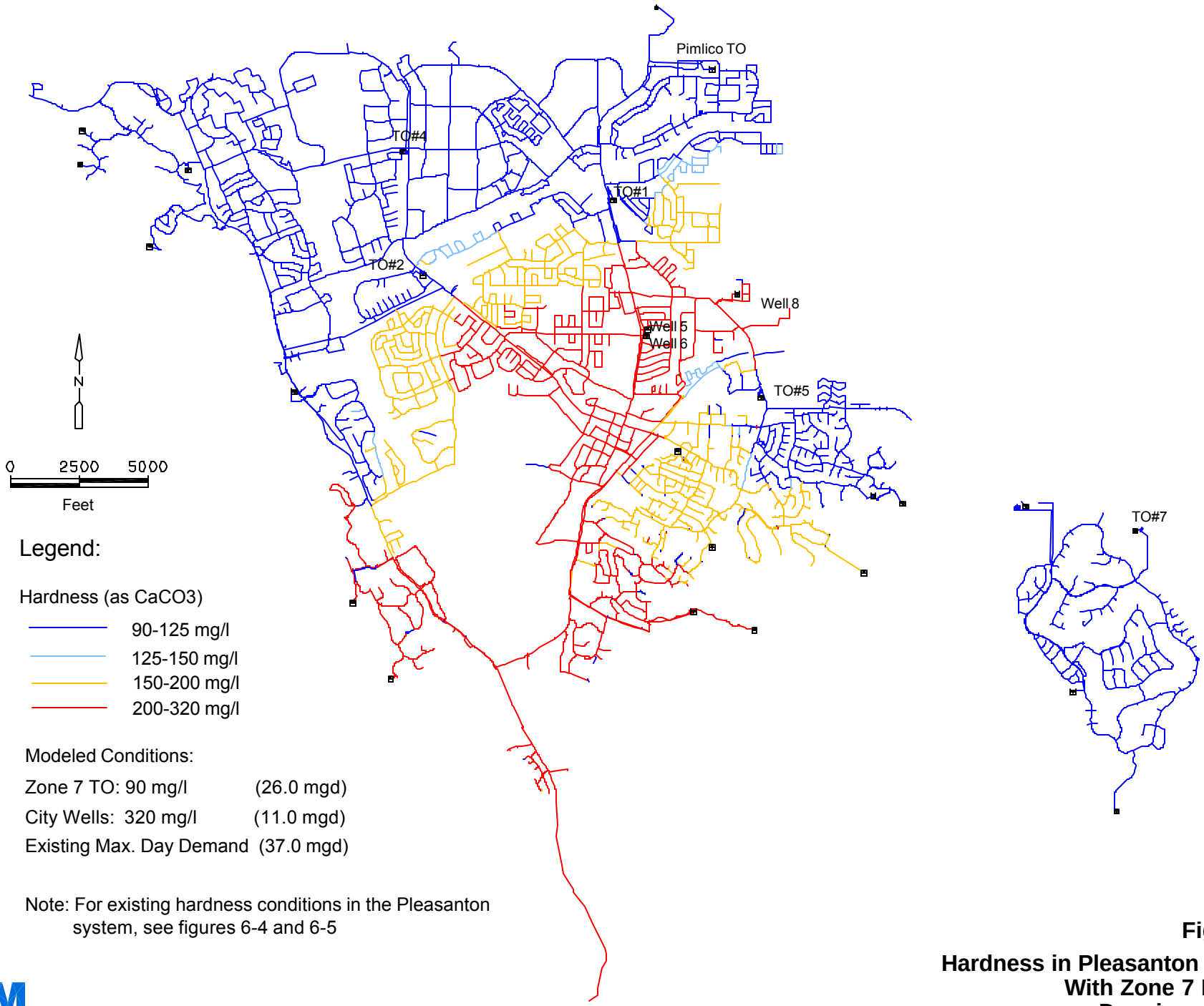



**Figure 7-1**

**Hardness in Pleasanton System With Zone 7 Planned De-mineralization**

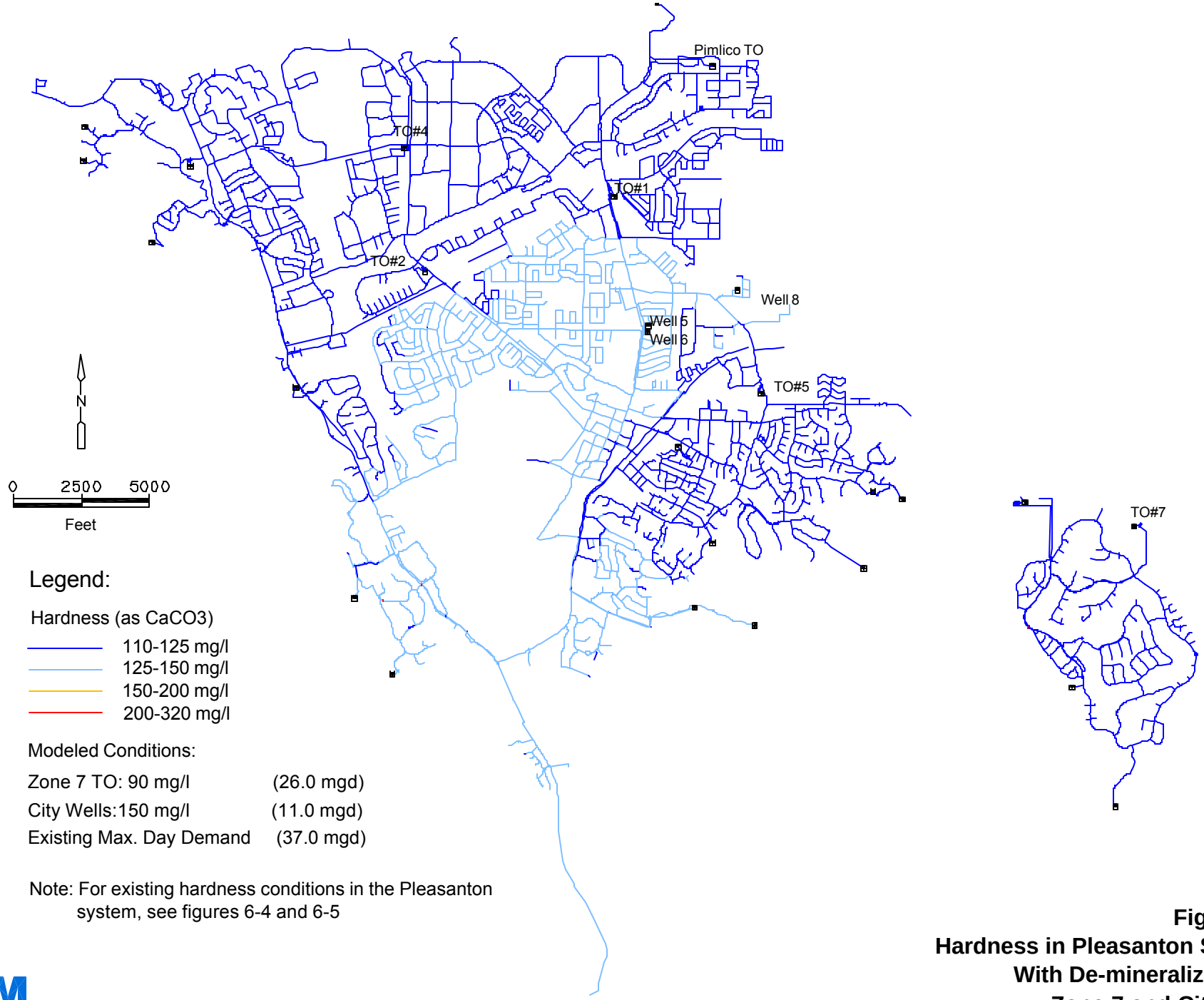
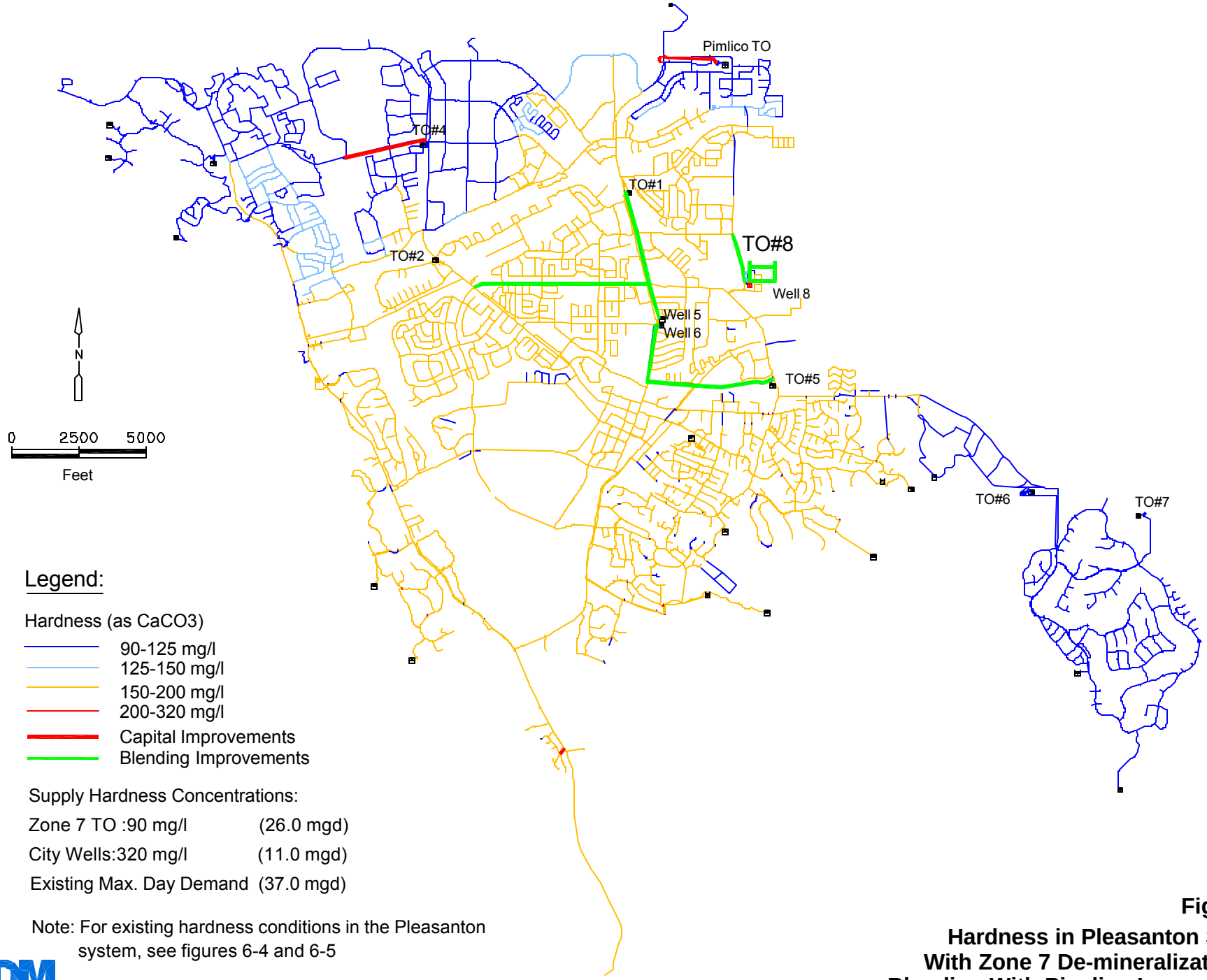



**Figure 7-2**
**Hardness in Pleasanton System With De-mineralization at Zone 7 and City Wells**

CDM




## Legend:

Hardness (as CaCO3)

- 90-125 mg/l
- 125-150 mg/l
- 150-200 mg/l
- 200-320 mg/l
- Capital Improvements
- Blending Improvements

Supply Hardness Concentrations:

| | |
|---|---|
| Zone 7 TO :90 mg/l | (26.0 mgd) |
| City Wells:320 mg/l | (11.0 mgd) |
| Existing Max. Day Demand | (37.0 mgd) |

Note: For existing hardness conditions in the Pleasanton system, see figures 6-4 and 6-5

CDM

**Figure 7-3**

**Hardness in Pleasanton System With Zone 7 De-mineralization and Blending With Pipeline Improvements**

Demineralization has a significantly higher cost, due to higher capital cost (about 40 percent higher). Additionally, demineralization has significant operating costs, due to the power, chemical and labor requirements. As a result, the unit cost is about 4 times higher than the blending pipelines. Therefore, blending pipelines were selected as the preferred option and are included in the CIP.

## 7.3 Recommended Improvements and Phasing

This section presents information on the recommended improvements and phasing for supply and distribution facilities. Figure 7-4 and Tables 7-4 through 7-7 summarize recommended improvements.

### 7.3.1 Supply

Up to 8 mgd of new supply capacity will be needed by buildout. A portion of this will be met from Turnout 6, which has been constructed, but is currently not active. This turnout will be used to supply a future pump station being constructed as part of improvements required for the Vineyard Corridor specific plan area, and will provide redundancy in turnout capacity to the Ruby Hill area.

As part of improvements associated with the Tassajara Reservoir, CDM recommends a new 5,000 gpm (7 mgd) turnout at Pimlico Drive. This turnout will improve hydraulics and water quality in Tassajara Reservoir, and provide redundancy for the Lower zone.

CDM also recommends a new 5,000 gpm (7 mgd) turnout near well 8 after Zone 7 implements demineralization improvements to reduce hardness of well water supplied to City of Pleasanton. This turnout is not needed for hydraulic capacity, but would be used, in conjunction with pipeline improvements, to blend flows with Well 8 water to reduce hardness of water entering the distribution system.

***Table 7-4***
***Recommended Pump Capacity and Water Quality Improvements***

| *Zone* | *Facility Name* | *Recommended Additional Firm Capacity (mgd)* |
|---|---|---|
| **Capacity Required for Existing Conditions** | | |
| 770 | Longview | 0.2 |
| Bonde | Vineyard | 1.2 |
| Bonde | TO #6 | 1.8 |
| **Additional Capacity Required for Buildout Conditions** | | |
| 770 | Longview | 0.5 |
| Bonde | McCloud | 1.8 |
| Bonde | TO#6 | 2.5 |
| Ruby Hill Upper | Ruby Hill Upper | 1.2 |
| Kottinger Ranch | Kottinger Ranch | 0.3 |
| **Water Quality Improvements** | | |
| Bonde | North Sycamore | Install bypass valve |
| Moller 770 | Laurel Creek | Install bypass valve |
| Dublin Canyon | Canyon Meadows | Install bypass valve |

### 7.3.2 Pump Stations

Table 7-4 summarizes required pump station capacity and water quality for existing and buildout conditions.

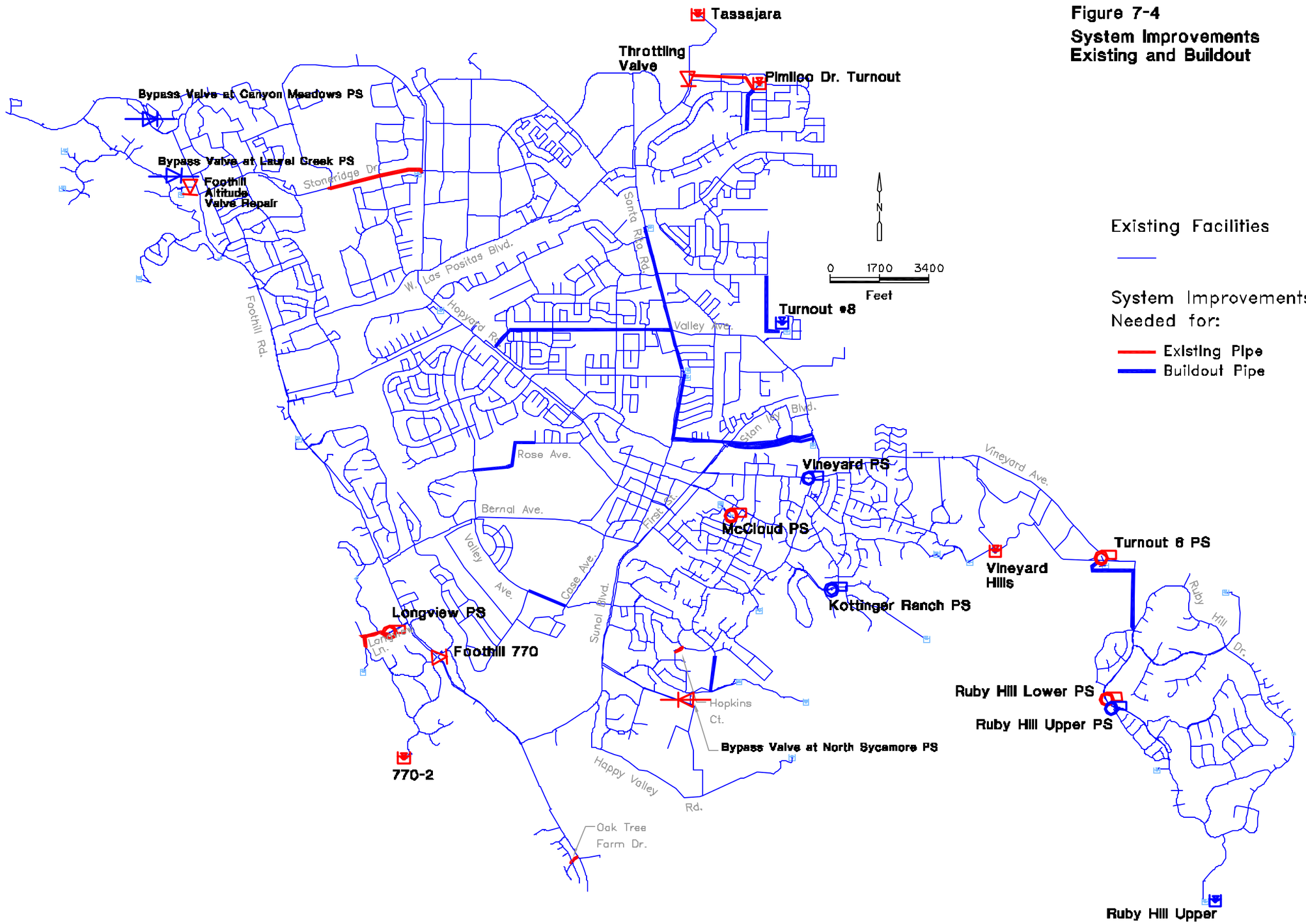



**Figure 7-4**
**System Improvements Existing and Buildout**

Longview Pump Station shows a deficit of 0.5 mgd under existing demand conditions and 0.7 mgd by buildout. A pump similar to the existing pumps is needed, which is sufficient to meet demands through buildout.

Bonde and Lower Ruby Hill zones have an existing deficit of 2.1 mgd, and buildout deficit of 6.1 mgd. Based on zone hydraulics, improvements are proposed for the existing McCloud and Vineyard pump stations, as well as the proposed Turnout 6 pump station. Pumps serving Lower and Upper Ruby Hill are currently housed in a combined Ruby Hill Pump Station. CDM recommends improvements for Upper Ruby Hill zone to be made by switching one of the two existing Lower Ruby Hill pumps to pump to the Upper Ruby Hill Zone. Turnout 6 Pump Station will include additional pumping capacity to make up for this reduction in capacity to Lower Ruby Hill zone.

Kottinger Ranch pump station currently has 0.1 mgd of excess pumping capacity, but will need expansion by 0.3 mgd under buildout conditions.

CDM has included recommendations for water quality improvements consisting of new bypass valves[1] at North Sycamore, Laurel Creek and Canyon Meadows pump stations. Although priorities have been designated for these improvements, and the City should review priorities based on operating and water quality experience. The City may wish to consider installation of the bypass valve at North Sycamore Pump Station in conjunction with proposed developer improvements for the Happy Valley development project, which will add new storage to Bonde zone, North Sycamore area.

### 7.3.3 Reservoirs

Table 7-5 summarizes improvements recommended for reservoir capacity. The reservoir capacity improvements listed in Table 7-5 are those needed to maintain operating levels within the top 25 percent of the reservoir volume.

***Table 7-5***
***Recommended Reservoir Capacity Improvements***

| Zone | Facility Name | Capacity Required (mg) | When Required |
|---|---|---|---|
| Lower | Tassajara | 5.0 | Existing |
| 770 | 770-2 | 0.6 | Existing |
| Bonde-Lower Ruby Hill | Vineyard | 1.4 | Existing (required for Vineyard corridor development) |
| Upper Ruby Hill | Upper Ruby Hill | 0.5 | Buildout |

[1] Assumed to be hydraulic pressure reducing valves with solenoid open/close capability.

Under existing conditions, the *Lower zone* has a nominal storage deficit of 0.7 MG. By buildout, this deficit will increase to 5.0 MG. The deficit calculation assumes that only 25 percent of the available volume (8.2 MG) in Tassajara Reservoir can be used, based on the current operating configuration of the reservoir. However, implementation of proposed improvements for Tassajara Reservoir would reduce the storage deficit to 1.1 MG. Since the diurnal curve evaluation indicated that only 12 percent of maximum day demand for Lower Zone is met from storage (1.9 MG at buildout), compared with a criterion of 25 percent of maximum day demand (3.9 MG at buildout), no new storage is recommended for Lower Zone.

The *770 zone* shows a deficit of 0.4 MG under existing conditions and an additional deficit of 0.2 under buildout conditions. The hydraulic analysis indicated that the storage for the 770 zone needs to be located near the 770-2 reservoir site to better balance the flows between the two reservoirs in the zone.

The *510 zone* shows a deficit of 0.1 MG under existing condition and an additional deficit of 0.04 under buildout conditions. However, the hydraulic analysis shows that 510 Reservoir operates between 70 and 100 percent full. Therefore, no additional storage was added in this zone.

The *Dublin Canyon zone* shows a surplus of 0.1 MG under existing conditions, but it shows a deficit of 0.1 MG under buildout conditions. The hydraulic analysis shows that Dublin Canyon Reservoir operates between 72 and 100 percent. Therefore, no additional storage was added in this zone.

The combined *Bonde* and *Ruby Hill Lower zone* shows a nominal deficit of 0.1 MG under existing conditions and an additional 1.3 MG under buildout conditions. All the required storage was added at the proposed Vineyard Hills Reservoir.

The *Ruby Hill Upper zone* currently has a 0.5 MG storage surplus. By buildout, the zone will have a deficit of 0.5 MG. A new storage reservoir is assumed to be adjacent to the existing reservoir.

### 7.3.4 Pipelines

Table 7-6 summarizes recommended distribution system pipeline improvements. The table shows improvements for existing and buildout demand conditions. The pipeline improvements required to meet existing deficiencies were sized for buildout conditions to accommodate future growth. Improvement projects are described below:

- A 12-inch diameter pipeline is needed under existing conditions for *770 zone*. This pipeline is located on the discharge side of Longview Pump Station and could either parallel or replace the existing 6 to 8-inch diameter pipeline along Longview Lane. This project will provide adequate transmission capacity to *770 zone* and improve the performance of the Longview Pump Station.

- A 12-inch diameter pipeline is needed under existing demand conditions to alleviate the 6-inch diameter bottleneck along Hopkins Court in *Bonde Zone*. This bottleneck is a hydraulic constraint that is isolating Lund Reservoir from the rest of the Bonde zone. This project will provide transmission capacity and improve water movement in Bonde zone and also increase water turnover under low demand conditions which helps improve water quality.

***Table 7-6***
***Recommended Pipeline Improvements***

| Pipe ID | Zone | Location | Existing Diameter (in) | Parallel Pipeline needed | Length (ft) | Reason |
|---|---|---|---|---|---|---|
| **Improvement Recommended for Existing** | | | | | | |
| WB6C4P113118P | 770 | Longview Ln | 8 | 12 | 411 | Transmission |
| WB6C4P107113P | 770 | Longview Ln | 6 | 12 | 126 | Transmission |
| WB6C4P104107P | 770 | Longview Ln | 6 | 12 | 383 | Transmission |
| WB6C4P104401P | 770 | Longview Dr | 8 | 12 | 430 | Transmission |
| WD6C3P310405P | Bonde | Hopkins Ct | 6 | 12 | 243 | Transmission |
| WD6C3P405409P | Bonde | Hopkins Ct | 6 | 12 | 61 | Transmission |
| WB2D3P101206P | Lower | Stoneridge Dr | 12 | 16 | 119 | Transmission |
| WB2D3P101205P | Lower | Stoneridge Dr | 12 | 16 | 1414 | Transmission |
| WB2C4P201204P | Lower | Stoneridge Dr | 12 | 16 | 16 | Transmission |
| WB2C4P201410P | Lower | Stoneridge Dr | 12 | 16 | 1746 | Transmission |
| WB2C3P404410P | Lower | Johnson Dr | 12 | 16 | 72 | Transmission |
| WD4B2P401404 | Lower | Kamp Dr | 12 | 16 | 102 | Transmission |
| PIMLICO-TO | Lower | | -- | 20 | 2216 | Transmission |
| WC8D1P508511P | FH-770 | Oak Tree Farm Dr | 8 | 10 | 210 | Fire flow |
| WC8D1P504508P | FH-770 | Oak Tree Farm Dr | 8 | 10 | 62 | Fire flow |
| WC8D3P107504P | FH-770 | Oak Tree Farm Dr | 8 | 10 | 17 | Fire flow |
| T05 – Well 6 | Lower | Del Valle Parkway/ Santa Rita Road | - | 16 | 7373 | Blending |
| T01 – Well 5 | Lower | Santa Rita Road | - | 16 | 5344 | Blending |
| Valley Avenue | Lower | Valley Avenue | - | 16 | 5900 | Blending |
| Well 8 – Mohr | Lower | From Well 8 to Mohr Avenue | - | 16 | 2037 | Blending |
| **Improvement Recommended for Buildout** | | | | | | |
| TO#3-PIMLICO | Lower | From TO#3 To Pimlico Turnout | -- | 20 | 1765 | Transmission |
| WD5B2P224401P | Bonde | From TO#5- Stanley Dr | -- | 16 | 2986 | Transmission |
| PROP-TO-LUND | Bonde | Independence Dr | -- | 12 | 1100 | Transmission |
| TO_ZENATO_PL | RHL | Winery Line | -- | 16 | 3600 | Transmission |
| ROSE-DR | Lower | Rose Drive | -- | 16 | 2818 | Transmission |
| VALLEY-2 | Lower | Bernal Ave | -- | 16 | 2759 | Transmission |
| VALLEY-1 | Lower | Valley Ave between Laguna Creek and Case Ave | -- | 16 | 1393 | Transmission |

- A 10-inch diameter pipeline parallel to the existing 8-inch is required along Oak Tree Farm Road in *Foothill 770 Zone* under existing demand conditions. This pipeline is required to meet the minimum 20 psi residual pressure for fire flow demand.

- A 16-inch diameter pipeline in *Lower* Zone, parallel to the existing 12-inch is needed under existing demand conditions along Stoneridge Drive to improve hydraulic conditions from Turnout No. 4 to Foothill Reservoir. This project will reduce the headloss in the existing 12-inch diameter pipe and improve the filling cycle of the Foothill Reservoir. Without pipeline improvements Foothill Reservoir is cycling between 54 percent and 64 percent full. With pipeline improvements the reservoir would cycle between 60 percent and 75 percent full under existing conditions. Under buildout conditions the reservoir would cycle between 77 and 92 percent as a result of the additional improvements to the Tassajara area.

- A 20-inch diameter pipeline is needed in *Lower Zone* to deliver water from Zone 7 system through the future Pimlico Turnout to Tassajara Reservoir.

- A 20-inch diameter pipeline is needed in *Lower Zone* as a second feed to Tassajara Reservoir from the existing Turnout No. 3. This project will provide redundancy and increase reliability to supply the Lower zone.

- A 16-inch diameter pipeline is needed in *Lower Zone* under buildout demand conditions along Del Valle Parkway from Turnout No. 5 to Stanley Drive. This project will reduce headloss in the existing 12-inch pipeline along Vineyard Avenue and improve the filling cycle in Sycamore Reservoir.

- A 16-inch diameter pipeline is needed in *Lower Zone* under existing demand conditions along Kamp Drive at the discharge side of Well 8. This project will reduce the headloss in the existing 12-inch diameter pipeline.

- A 16-inch diameter pipeline is needed in *Lower Ruby Hill Zone* to serve as the discharge line of the new Turnout No. 6 to connect to the Lower Ruby Hill zone.

The following pipeline projects are planned improvements by the City, identified in previous studies.

- A 12-inch diameter pipeline is needed in *Bonde Zone* from Independence Drive that connects to the pipeline feeding Lund Reservoir, to improve transmission capacity in the Bonde zone.

- A 16-inch diameter pipeline is needed in *Lower Zone* along Rose Avenue between Calico Lane and Valley Avenue, to increase transmission capacity and improve water quality in the Lower zone.

- A 16-inch diameter pipeline in *Lower Zone* along Bernal Avenue between Pleasanton Avenue and Valley Avenue, to increase transmission capacity and improve water quality in the Lower zone. Model results show that this pipeline provides minimal benefit, and it was removed from the planned improvement list.

- A 16-inch diameter pipeline is needed in *Lower Zone* along Valley Avenue between Bernal and Case Avenue to increase transmission capacity and improve water quality in the Lower zone.

### 7.3.5 Valves

Table 7-7 summarizes the pressure reducing station improvements for existing and buildout demand conditions.

***Table 7-7***
***Recommended Pressure Reducing Station Improvements***

| Zone | Existing Peak Hour Plus Fire (gpm) | Buildout Peak Hour Plus Fire (gpm) | Existing PRV Station Capacity (gpm) | Improvement (Timeframe Required) |
|---|---|---|---|---|
| **Recommended Capacity Improvements** | | | | |
| Foothill 770 | 2,240 | 2,560 | 2,200 | Replace one 2-inch valve with one 4-inch valve (Existing) |
| **Recommended Water Quality Improvements** | | | | |
| Lower | --- | --- | --- | 16-inch throttling valve (Existing) |

Table 7-7 shows that the existing pressure reducing station that serves Foothill 770 is marginally deficient under existing maximum day demand conditions and replacement of one 2-inch valve with a 4-inch valve is needed.

A new throttling valve would be needed under existing demand conditions to control the flow from Tassajara Reservoir and improve water quality under low demand conditions.

# Section 8
# Capital Improvement Program

This section presents the recommended capital improvements projects for existing and buildout conditions.

## 8.1 Capital Cost Estimates

Planning-level capital cost estimates were developed for improvements. The estimated capital costs include construction costs, contingencies, and markups for engineering, legal, and administration fees. The following markups were used:

- Contingency: 20 percent for tanks, 30 percent for all other facilities
- Engineering, Legal, Environmental, Administration: 35 percent

Markups were compounded, so the total markup on base construction costs is 1.76. Pipelines are assumed to be constructed within public right-of-way or easements dedicated to the City. Land acquisition costs have not been included.

Cost estimates are based on cost data developed from past construction projects for the City of Pleasanton and capital cost estimates for similar projects for other Bay Area utilities. Costs are in current dollars and are indexed to the Engineering News Record's Construction Cost Index for San Francisco of 7644 for December 2002. Table 8-1 summarizes unit capital costs for water system improvements.

***Table 8-1***
***Unit Capital Cost for Water System Improvements***
***(December 2002 $)[1]***

| **PIPELINES** | | **PUMP STATIONS** | |
|---|---|---|---|
| *Diameter* | *Unit Capital Cost ($/foot)* | *HP* | *Total Capital Cost ($)[2]* |
| 10 | 160 | 20 | 264,000 |
| 12 | 180 | 40 | 426,000 |
| 16 | 220 | 60 | 558,000 |
| 20 | 320 | 80 | 676,000 |
| | | 100 | 778,000 |
| **VALVE STATIONS** | | **STORAGE[3]** | |
| *Size (in)* | *Total Unit Capital Cost ($)* | *Capacity (MG)* | *Total Capital Cost (Million $)* |
| 4 | 30,000 | 0.5 | 0.8 |
| 16 | 250,000 | 1.0 | 1.2 |
| Bypass Valve | 100,000 | 1.5 | 1.5 |
| **TURNOUTS** | | 2.0 | 1.8 |
| *Unit* | *Total Unit Capital Cost ($)* | | |
| 1 | 500,000 | | |

(1) Includes contingency engineering, legal, and administration.
(2) Costs are for new pump stations and expansions of existing pump stations. Based on CDM's knowledge of site characteristics, cost of pump stations were adjusted accordingly as follows: Longview PS – 130%; Vineyard PS – 140%; McCloud PS – 80%; Kottinger Ranch PS – 80%.
(3) Costs are for above-grade steel reservoirs.

## 8.2 Recommended Improvements and Phasing

Table 8-2 and Figure 8-1 summarize planned improvements, costs and phasing. Table 8-2 presents the recommended CIP projects and costs by time frame. Three time frames were used to group improvements: 2003 – 2007, 2008 – 2011 and 2012 - 2015. Improvements were initially assigned a time-frame based on whether they are needed for existing or buildout conditions. Then, priorities were assigned within the three time-frames based the results of the deficiency evaluation.

The right-hand side of Table 8-2 allocates costs between existing users and future users. Costs allocated to existing users are for projects that are deficient under existing conditions. Costs allocated to future users are to meet future growth. The following were considered in allocating costs:

- For pipeline, pump station and reservoir projects that are needed for existing conditions, but sized for buildout, costs were allocated between existing and future users based on the pipeline hydraulic capacity required for existing needs and the pipeline hydraulic capacity required for future needs.

- Water quality improvements were proportioned between existing and future users (80 percent to existing, 20 percent to future, based on existing and buildout demands), since the water quality improvements will benefit both existing and future users.

The total capital cost of new facilities is estimated to be $ 20 million, with $7 million allocated to existing system needs and $13 million for future growth.

### New Connections Evaluation

The City uses capital improvement costs, projected future customer connections, and existing system value estimates to determine connection fees, based on equivalent 5/8-inch Invensys meters, the size of the standard residential service meter.

CDM prepared estimates of the projected number of equivalent future customer connections, for the City to use in developing connection fees. To develop these estimates, CDM used the following approach:

- Estimated the number of future residential and non-residential connections, using detailed planning projections provided by the City's Planning and Community Development Department.

- For non-residential connections, calculated the number of equivalent 5/8" connections based on the water demand, compared with residential water demand. For example, future single-family residential water use is estimated at 1463 gpm for 2703 5/8" meter connections. Commercial users have a future demand of 455 gpm; therefore, the number of equivalent 5/8-inch connections for commercial use was calculated as 455/1,463 x 2,703 residential connections.

**Figure 8-1**
**Phasing of System Improvements**

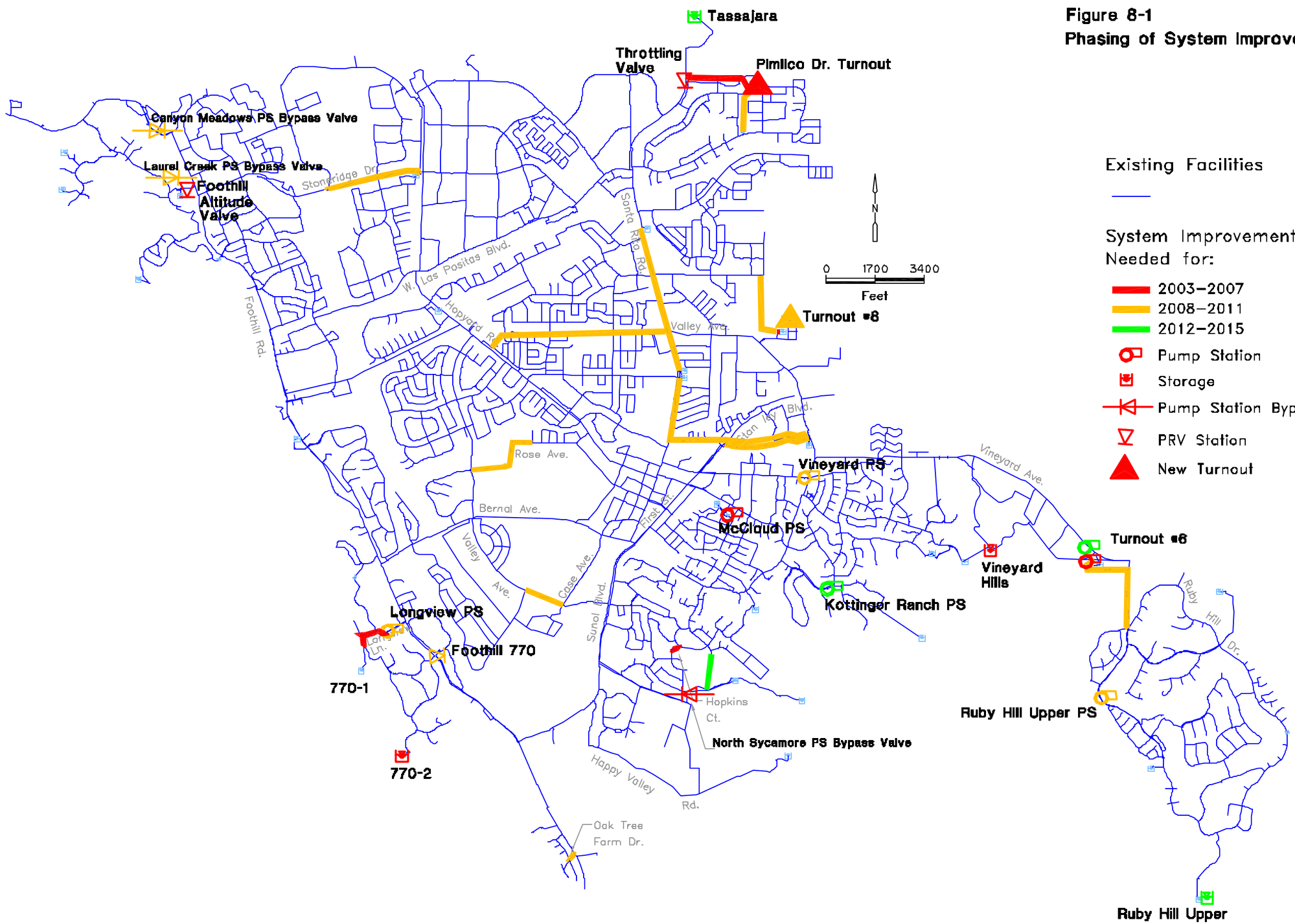


**Table 8-2**
**Capital Improvement Program**

| | Priority | Facility | Capacity | Length (ft) | Diam (in) | Cost ($M) | Allocation of Costs ($M) Existing | Allocation of Costs ($M) Future |
|---|---|---|---|---|---|---|---|---|
| **Recommended Improvements for 2003-2007** | | | | | | | | |
| Pipelines | 1 | Tassajara Pipeline | -- | 2,200 | 20 | $ 0.70 | $ 0.25 | $ 0.45 |
| | 2 | Longview Discharge Pipeline | -- | 1,400 | 12 | $ 0.25 | $ 0.11 | $ 0.14 |
| Pump Stations | 1 | Vineyard Corridor (TO#6)(2) | 1.8 mgd | | | $ 0.54 | $ - | $ 0.54 |
| | 2 | McCloud Pump Station | 1.8 mgd | | | $ 0.52 | $ 0.52 | $ - |
| Storage | 1 | 770-2 | 0.6 MG | | | $ 0.90 | $ 0.56 | $ 0.34 |
| | 1 | Vineyard Hills | 1.4 MG | | | $ 1.45 | $ 0.13 | $ 1.32 |
| Valves | 1 | Tassajara Throttling Valve | | | 16 | $ 0.27 | $ 0.10 | $ 0.17 |
| | 2 | North Sycamore PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| Turnouts | 1 | Pimlico Drive Turnout | 5000 gpm | | | $ 0.50 | $ 0.18 | $ 0.32 |
| **Subtotal 2003-2007** | | | | | | **$ 5.23** | **$ 1.93** | **$ 3.30** |
| **Recommended Improvements for 2008-2011** | | | | | | | | |
| Pipelines | 1 | Oak Tree Farm Road | -- | 300 | 10 | $ 0.05 | $ - | $ 0.05 |
| | 2 | TO#3 to Pimlico Turnout | -- | 1,800 | 20 | $ 0.58 | $ 0.21 | $ 0.37 |
| | 1 | Winery Line from Turnout #6 | -- | 3,600 | 16 | $ 0.79 | $ - | $ 0.79 |
| | 1 | Stoneridge | -- | 3,400 | 16 | $ 0.75 | $ - | $ 0.75 |
| | 2 | From TO#5 to Stanley Dr. | -- | 3,000 | 16 | $ 0.66 | $ - | $ 0.66 |
| | 2 | Kamp Drive | -- | 100 | 16 | $ 0.02 | $ 0.02 | $ - |
| Pump Stations | 2 | Vineyard Pump Station | 1.2 mgd | | | $ 0.84 | $ - | $ 0.84 |
| | 2 | Longview Pump Station | 0.7 mgd | | | $ 0.75 | $ - | $ 0.75 |
| | 1 | Upper Ruby Hill Pump Station | 1.2 mgd | | | $ 0.76 | $ - | $ 0.76 |
| Valves | 2 | Foothill 770 PRV | | | 4 | $ 0.03 | $ - | $ 0.03 |
| | 2 | Laurel Creek PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| | 2 | Canyon Meadows PS Bypass Valve | | | 6 | $ 0.10 | $ 0.08 | $ 0.02 |
| **Subtotal 2008-2011** | | | | | | **$ 5.43** | **$ 0.39** | **$ 5.04** |
| **Recommended Improvements for 2012-2015** | | | | | | | | |
| Pipelines | 1 | Independence Dr. | | 1,100 | 12 | $ 0.20 | $ - | $ 0.20 |
| | 2 | Rose Dr. | | 2,800 | 16 | $ 0.62 | $ - | $ 0.62 |
| | 2 | Bernal Ave betw. Valley Ave & Pleasanton Ave | | 2,800 | 16 | $ 0.62 | $ - | $ 0.62 |
| | 1 | Valley Ave betw. Laguna Crk Ln and Case Ave | | 1,400 | 16 | $ 0.31 | $ - | $ 0.31 |
| | 2 | Hopkins Court | | 300 | 12 | $ 0.05 | $ - | $ 0.05 |

**Table 8-2**
**Capital Improvement Program**

| | Priority | Facility | Capacity | Length (ft) | Diam (in) | Cost ($M) | Allocation of Costs ($M) Existing | Allocation of Costs ($M) Future |
|---|---|---|---|---|---|---|---|---|
| Storage | 1 | Ruby Hill | 0.5 MG | | | $ 0.80 | | $ 0.80 |
| PS | 1 | Vineyard Corridor (TO#6)[2] | 2.5 mgd | | | $ 0.41 | $ - | $ 0.41 |
| | 2 | Kottinger Ranch | 0.3 mgd | | | $ 0.21 | $ - | $ 0.21 |
| **Subtotal 2012-2015** | | | | | | **$ 3.22** | **$ -** | **$ 3.22** |
| **Water Quality Blending Improvements - No Assigned Timeframe (1)** | | | | | | | | |
| Pipelines | 2 | TO # 5 to Well # 6 | -- | 7,400 | 16 | $ 1.63 | $ 1.30 | $ 0.33 |
| | 2 | TO # 1 to Well # 5 | -- | 5,300 | 16 | $ 1.17 | $ 0.94 | $ 0.23 |
| | 2 | Valley Avenue | -- | 5,900 | 16 | $ 1.30 | $ 1.04 | $ 0.26 |
| | 2 | Well # 8 to Mohr Avenue | -- | 2,000 | 16 | $ 0.44 | $ 0.35 | $ 0.09 |
| Turnouts | 1 | Turnout # 8 near Well # 8 | 5000 gpm | | | $ 0.50 | $ 0.40 | $ 0.10 |
| **Subtotal – WQ Blending Improvements** | | | | | | **$ 5.04** | **$ 4.03** | **$ 1.01** |
| **TOTALS** | | | | | | **$ 18.92** | **$ 6.35** | **$ 12.57** |

(1) These improvements are not assigned a time frame since they are dependent on implementation of Zone 7 water quality improvements to reduce hardness and salts in its delivered water.

(2) Includes firm pumping capacity required to meet zone demands plus 1.2 mgd of capacity relocated from Ruby Hill PS to Vineyard Corridor (TO #6) PS. This relocation is required to provide for new pumping capacity at Ruby Hill PS for Upper Ruby Hill pressure zone, while maintaining the same total number of pumps, due to pump station space constraints.

Table 8-3 shows the future connections that would be served from the existing water system. These connections were identified by the City to serve future customers. Approximately 5,200 equivalent new connections will be needed to meet future demands.

**Table 8-3**
**Estimated Number of Future Connections for New Development**

| Customer Class | Meter Size | Future Water Demands (gpm) | Number of Future Connections | Equivalent Number of Future 5/8" Connections[3] |
|---|---|---|---|---|
| Single-Family Residential | 5/8" | 1,463 | 2,703 [1] | 2,703 |
| Multi-family Residential | 1.5"-6" | 33 | 17 [2] | 61 |
| Commercial | 5/8"-4" | 455 | 98 | 841 |
| Schools and Fire Station | 2" | 82 | 4 | 152 |
| Senior Assisted Living | 3" | 247 | 5 | 456 |
| Parks | 2" | 532 | 8 | 983 |
| | **Totals** | 2,812 | 2,835 | 5,196 |

(1) Future development includes 2703 new single family parcels, all assumed to have 5/8" meters.

(2) Future multi-family residential includes 166 apartment units. Assumed 17 new meters for multiple family residential.

(3) Equivalent connections for uses other than single-family residential calculated based on water use, relative to single-family residential. For example, commercial equivalent connections = 455 gpm/1463 gpm x 2703 connections = 841 connections.

# Section 9
# Renewal and Replacement Cost Assessment

This section presents an assessment of criteria to use in determining costs for renewal and replacement of existing water system facilities (pipelines, pump stations, reservoirs). For this assessment, CDM contacted several Bay Area utilities, and reviewed available American Water Works Association (AWWA) literature. This section describes the City's current methodology, reviews key assumptions for useful life of facilities, briefly summarizes the approaches used by other agencies, and provides recommendations regarding additional criteria that the City may want to consider. The Master Plan does not include a renewal and replacement evaluation.

## 9.1 Current City Methodology

City water rates currently include a cost component for renewal and replacement of existing water system facilities (pipelines, pump stations, reservoirs) reaching the end of their useful life. This cost component is important to ensure that adequate funds will be available to ensure satisfactory long-term water system performance.

The renewal and replacement cost component is currently based on the age of the existing facilities and assumptions regarding their useful life. In 1996, an inventory of the City's transmission and distribution system was compiled. This inventory included length of water pipelines by diameter, number of water service meters by size, and number of fire hydrants. It also included an inventory of water equipment and other improvements, such as pump stations, reservoirs, tanks, and wells, and related components.

For each item in the City's inventory, the installation date and the anticipated useful life (in years) are identified. This information is used to determine a replacement date of the facility at the end of its estimated useful life. A replacement cost for the facility is also estimated. This information is used to determine an annual amount to be accumulated each year so that funds will be available to replace the facilities at the end of their useful life.

## 9.2 Review of Useful Life Assumptions

The key assumption in the City's renewal and replacement program is the anticipated useful life of the water facilities. Table 9-1 summarizes a suggested range of useful life assumptions for major water system components, based on engineering judgment and our experience with similar water systems. It should be noted that there is little "hard" data available, in general, on the useful life expectancies of facilities. Many variables determine the actual service life of specific facilities, such as the design, installation, maintenance procedures, and local conditions. As discussed in a subsequent subsection, other local utilities typically base their estimates of future renewal and replacement costs using information on the actual condition of their

facilities, such as leak/break records for pipelines, and field assessments of pump stations and reservoirs.

***Table 9-1***
***Summary of Review of Useful Life Assumptions***

| *Item* | *City's Useful Life Estimate (years)* | *General Range for Useful Life (years)* |
|---|---|---|
| **Pipelines**<br>(Ranges shown assume good design, fabrication, installation, and maintenance. These are overall system-wide ranges. Timeframe may be shorter in specific areas, if leak/repair history indicates recurring problems in areas.) | | |
| Asbestos cement (ACP) | 50 | 50 minimum,<br>could be 80 to 100 under excellent conditions. |
| Plastic (PVC) | 50 | 50 minimum,<br>could be100 under excellent conditions. |
| Ductile iron (DIP), cast iron (CIP), steel<br>Non-corrosive soil<br>Moderately corrosive soil<br>Corrosive to extremely corrosive soil | 50 | <br>100<br>50 – 75 with proper cathodic protection<br>25 – 50 with proper cathodic protection |
| **Appurtenances** | | |
| Valves | NA | 25 |
| Water Service Meters | 30 | 15 – 20 |
| Fire Hydrants | 40 | 25 - 50 |
| **Storage Facilities** | | |
| Pre-stressed concrete reservoirs | 50 | 50 - 75 |
| Cast in place concrete reservoirs | 50 | 60 - 75 |
| Steel tanks | 50 | 40 – 60 (with periodic repainting) |
| **Pump Stations** | | |
| Structures | 40 - 50 | 40 - 50 |
| Pumps & mechanical equipment | 25 | 20 – 25 |
| Electrical | 15 | 10 - 20 |
| Instrumentation (telemetry) | 7 | 7 - 10 |
| Electrical backup generator | 25 - 50 | 20 - 25 |

The City's pipeline system contains a large amount of asbestos cement (AC) pipe, although the City no longer uses this type of pipe for new installations. AC pipe has excellent resistance to internal pressure and is not damaged by internal or external corrosive conditions. AC pipe is prone to brittle failure when subjected to shearing forces or mechanical abuse, i.e., if the pipe is disturbed, but this type of failure is typically easy to repair.

Based on our general knowledge and review of the available literature, continued use of the existing pipe for water conveyance does not pose a health concern for customers. The primary health issue with asbestos involves inhalation of airborne fibers into the lungs; this is associated with cutting the pipe during manufacturing and installation. No significant amount of asbestos in water conveyed by AC pipe is expected and waterborne asbestos is not identified as a health risk.

The Contra Costa Water District (CCWD) system also contains a large amount (about 70 percent) of asbestos cement pipe, and has no plans for systematic replacement of these pipelines due to type of material. CCWD replaces its AC pipes only as needed based on poor performance (historic leak and repair records), or if relocation is required. When AC sections are replaced or relocated, ductile iron pipe is now used instead of AC pipe. Care is taken when cutting existing AC pipes for new connections, relocations, or repairs to avoid exposing workers to potential airborne fibers. Typical procedures are followed to valve off affected sections during work, and then flush and disinfect the new section prior to returning it to service.

As discussed in a subsequent subsection under "Review of Other Programs", the CCWD pipeline renewal and replacement program is based primarily on leak/repair history. In the 1996 CCWD Treated Water Renewal & Replacement Study, the historic leak/repair data was correlated with pipe information, such as material and age. The analysis showed that the unprotected steel pipes in their system had a much higher incidence of repairs (per 1000 feet) than either cast iron or AC, while PVC and ductile iron pipes had the lowest incidence of repairs. The smaller diameter pipes (6-inches or less) had higher repair rates than larger diameter pipes. There was no obvious correlation between total number of leaks and pipe age.

## 9.3 Review of Other Programs

### Bay Area Water Agencies

The following water agencies in the Bay Area were contacted regarding their criteria for rehabilitation or replacement of existing water system facilities:

- Contra Costa Water District (CCWD) [1]
- East Bay Municipal Utility District (EBMUD) [2]
- Alameda County Water District (ACWD) [3]
- Dublin-San Ramon Services District (DSRSD) [4]

[1] CCWD information obtained from "Treated Water Renewal/Replacement Study", Final Report, June 1996 (prepared for CCWD by Metcalf & Eddy).
[2] EBMUD information obtained from memo provided by Patti Dustman, Senior Engineer, with EBMUD Asset Management Group.
[3] ACWD information obtained from phone discussions with Peggy Cassidy and Shannon Sweeney, ACWD Engineering and Maintenance Departments, respectively.
[4] DSRSD information obtained from phone conversation with Dave Requa, DSRSD Director of Engineering and Construction. DSRSD uses the same consultant as the City of Pleasanton for their renewal & replacement study.

In general, there are two types of criteria:

- Criteria for evaluating the condition of facilities. These criteria are used to determine specific problems and recommend specific projects required to solve those problems.

- Criteria for setting priorities for specific projects. These criteria are used to prioritize implementation of specific projects by their priority order of importance within the annual budget allocated for renewal and replacement projects, i.e., most important improvements are implemented first.

Tables 9-2, 9-3 and 9-4 summarize, respectively, the criteria for pipelines, pump stations, and reservoirs/tanks that are used by the other Bay Area water agencies, as well as those currently used by the City. As indicated in these tables, several other water agencies evaluate several factors related to the actual condition of the water facilities to determine their renewal and replacement needs. This evaluation typically involves compilation of facilities data and leak and repair records, and periodic field inspections.

***Table 9-2***
***Summary of Renewal & Replacement Criteria for Pipelines***
***Used by Bay Area Water Agencies***

| ***Agency*** | ***Criteria for Pipelines*** | |
|---|---|---|
| | ***To Evaluate Facility Condition*** | ***To Set Priorities*** |
| Contra Costa Water District | • Performance – leak repair record<br>• Age<br>• Material<br>• Size | • Leaks/length of pipe<br>• Emergencies<br>• Size of connected pipe required to meet standards for fire flow or peak hour demands<br>• Material (unprotected metal, i.e., corrosion potential)<br>• Water quality problems<br>• Convenience of replacing connected pipe on the same street<br>• Coordination with other utilities or agencies |
| East Bay Municipal Utility District | • Primarily repair history<br>• Water quality complaints<br>• Low pressure complaints | Historic repair frequency is used to calculate a ratio of present worth of estimated future maintenance cost to replacement cost. Replacement candidates are prioritized by this ratio, grouped in geographic areas for construction efficiency, and coordinated with planned street improvements |
| Alameda County Water District | • Leak/break history | • Severity and frequency of leaks/breaks |
| Dublin-San Ramon Services District | • Age<br>• Estimated useful life | • Remaining useful life |
| City of Pleasanton | • Age<br>• Estimated useful life | • Remaining useful life |

***Table 9-3***
***Summary of Renewal & Replacement Criteria for Pump Stations***
***Used by Bay Area Water Agencies***

| ***Agency*** | ***Criteria for Pump Stations*** | |
|---|---|---|
| | ***To Evaluate Facility Condition*** | ***To Set Priorities*** |
| Contra Costa Water District | • Condition, including corrosion<br>• Performance:<br>- Actual vs. design flow<br>- Energy efficiency<br>- Vibration<br>- Noise<br>• Age – obsolete equipment<br>• Parts availability<br>• Access to site and equipment<br>• Safety of O&M staff<br>• Structural integrity, seismic performance | • Cost-effectiveness:<br>- Remaining useful life<br>- Near-term capacity deficiency<br><br>• Consequences of failure, i.e., what could happen if the facility failed:<br>- Number of services affected;<br>- Type of services affected, i.e., residential, commercial, etc. |
| East Bay Municipal Utility District | Each pump station assessed for potential upgrades every 25 years, or sooner if O&M staff identifies significant reliability, safety or efficiency issues during routine maintenance. Evaluation includes:<br>Structures – seismic fragility, excessive noise, hazardous materials, roof hatches.<br>Water transmission equipment – plant capacity, pump efficiency, pressure zone redundancy, PRV/surge valve availability.<br>Electrical – spare part availability, motor running time, equipment age relative to expected life, presence of hazardous materials in control panels, emergency power connection, NEC compliance.<br>Instrumentation & control – adequacy of monitoring and controlling capabilities. | Priorities based on weighted assessment of critical characteristics, using scaling factors to rate each characteristic (from most to least important) for public safety, employee safety, operational reliability, maintainability, reduced operating costs. |
| Alameda County Water District | • Useful life of equipment<br>• Ability to meet current design standards, e.g., current electrical standards<br>• Ability to meet changing operational criteria, e.g., increased fire flow protection, spare pump | • Remaining useful life<br>• Periodic inspections as part of preventive maintenance to document current condition and identify needed improvements to incorporate in CIP. |
| Dublin-San Ramon Services District | • Age<br>• Estimated useful life | • Remaining useful life |
| City of Pleasanton | • Age<br>• Estimated useful life | • Remaining useful life |

**Table 9-4**
**Summary of Renewal & Replacement Criteria for Reservoirs/Tanks Used by Other Bay Area Water Agencies**

| Agency | Criteria for Reservoirs/Tanks | |
|---|---|---|
| | **To Evaluate Facility Condition** | **To Set Priorities** |
| Contra Costa Water District | • Condition:<br>- Corrosion<br>- Cracks/peeling/appearance<br>- Settlement<br>- Leakage/erosion/drainage<br>• Performance – freeboard/overflow<br>• Age-obsolete equipment<br>• Parts availability (valves, controls, etc.)<br>• Access to site and equipment<br>• Safety of O&M staff<br>• Structural integrity, including seismic performance | • Cost effectiveness:<br>- Remaining useful life<br>- Near-term capacity deficiency<br>• Consequence of failure, i.e., what could happen if the facility failed:<br>- Redundancy, i.e., can the area be served by another facility?<br>- Number of services affected.<br>- Type of services affected, i.e., residential, commercial, etc.<br>- Environmental impacts such as erosion and flooding.<br>- Liability/property damage, i.e., District exposure to lawsuits. |
| East Bay Municipal Utility District | Concrete reservoirs – seismic performance<br><br>Steel tanks – age of interior coating, condition of interior coating, seismic and structural considerations, and other factors (water quality, regulatory compliance, safety) | Seismic upgrades of concrete reservoirs and replacement of old redwood tanks are top priority for implementation by 2005.<br>Prioritization of steel tanks based on criteria for evaluating condition, per facility assessments.<br>Typically tanks are rehabilitated to extend service life by 25 to 30 years, unless cost analysis shows that replacement is more cost-effective and/or more capacity is needed. |
| Alameda County Water District | • Seismic performance<br>• Condition, such as leakage<br>• Ability to meet current design standards, e.g., no longer use asphalt panels in tanks<br>• Ability to meet changing operational criteria, such as for increased fire flow protection<br>• Safety of O&M staff | • 5-year cycle of complete inspection and cleaning to document current condition and identify needed improvements to incorporate in CIP. |
| Dublin-San Ramon Services District | • Age<br>• Estimated useful life | • Remaining useful life |
| City of Pleasanton | • Age<br>• Estimated useful life | • Remaining useful life |

## Relevant AWWA Literature

CDM obtained several relevant references available from AWWA and the AWWA Research Foundation (AWWARF) and reviewed them for information regarding renewal and replacement criteria. These references focused on pipelines, since pipelines typically comprise the majority of water distribution facilities. The references discussed approaches and principles for pipeline renewal and replacement programs. However, they did not recommend values for expected useful life of facilities, since so many variables affect the useful life.

AWWA reference "Assessing the Future: Water Utility Infrastructure Management" was not yet available and therefore not reviewed. (AWWA, 2001)

Key relevant information in the references reviewed is briefly summarized below.

### AWWARF Guidance Manual – Water Main Evaluation for Rehabilitation/Replacement (1986)

This guidance manual covers the following topics: utility leak and break patterns; water main deterioration; assessing water main conditions; economic assessment models; distribution system information needs and organization; monitoring distribution system conditions; developing a water main decision planning system.

In general, this manual indicates that pipelines would be candidates for replacement or rehabilitation based primarily on potential for leaks/breaks. Once identified as a candidate due to leak/break potential, then other factors are considered in evaluating whether to rehabilitate or replace the pipe, and then in prioritizing the candidate projects for implementation.

Two evaluation approaches are discussed:

- Reactive approach when planning occurs after mains have deteriorated and broken, sometimes resulting in replacement on an emergency basis.
- Predictive approach when systematic planning occurs without relying solely on individual maintenance histories. This approach generally uses modeling to predict future deterioration of mains in order to estimate potential for leaks/breaks and its remaining useful life.

Criteria considered in evaluating whether to rehabilitate or replace a main may include some or all of the following:

- Main Characteristics: age, size, depth, corrosion, dead end main, type of material or joint, leak/break history
- System Characteristics: water quality, water pressure, operational flexibility, reduced pumping costs, increased carrying capacity
- Area Characteristics: soils data, corrosion potential, whether other construction is occurring, type of development (e.g., high profile or high visibility land use areas where potential water damage from ruptured main could result in significant damage claims)

In prioritizing rehabilitation or replacement projects, the following factors may be applicable:

- Structural condition

- Hazard potential (service disruptions, public safety, property damage, transportation disruption)
- Level of joint utility construction
- Cost comparisons for rehabilitation or replacement alternatives
- Hydraulic condition
- Water quality condition
- Role of the main (number of services, degree of fire protection provided)

### AWWARF Reference – Distribution Infrastructure Management: Answers to Common Questions (2001)

This guidance manual covers the following topics: importance of infrastructure management; obtaining and managing data; materials and performance; determining the condition of the system; assessing pipe condition; available pipe renewal technologies; and managing a pipeline renewal program.

Data identified as most helpful for a pipeline system renewal and replacement program are summarized below.

| *Materials Information* | *Performance Information* | *Environmental Information* |
|---|---|---|
| Pipe diameters, length<br>Locations of pipes and appurtenances<br>Material types<br>Pressure classes or ratings<br>Manufacturers<br>Ages<br>Coatings, linings, and cathodic protection information | Leak/break locations<br>Leak/break frequencies<br>Leak/break types, causes<br>Water losses (unaccounted for water)<br>Operating pressures<br>Flows | Soil types<br>Soil corrosivity<br>Water table location<br>Pipe depths<br>Traffic loading (usually based on location information)<br>Rainfall |

This reference recommends an integrated approach to infrastructure planning that addresses the three primary objectives of hydraulic capacity, reliability, and water quality, with cost-effectiveness being a key consideration in all areas. Techniques are discussed to provide the following system information at a macro level that is needed for the recommended integrated approach:

- Measure the general condition and performance of the pipeline system,
- Identify deficiencies and areas of potential weakness or concern,
- Identify components that may need further analysis or testing, and
- Determine appropriate rates for pipe replacement and rehabilitation.

## AWWARF Reference – Quantifying Future Rehabilitation and Replacement Needs of Water Mains (1998)

This reference discusses a predictive model (KANEW) developed to assess pipeline condition. It describes the model and the modeling process, as well as several case studies involving use of the model.

KANEW is a macro model providing overall planning guidance on how many miles of pipes of certain categories will need to be rehabilitated and replaced each year. It is not intended to provide location-specific rehabilitation and replacement information. The model uses non-linear aging functions to estimate pipeline life spans, based on specific data input for the particular water system. The aging functions model the pipeline aging process, mathematically described as age-dependent probabilities of change for the worse. The degree of aging varies with the progression of age, and depends on material and stress. For rehabilitated or replaced pipes, the aging process begins again at the time of rehabilitation/replacement.

The model uses water main inventory data with pipes categorized according to factors such as age, diameter, material, lined versus unlined, joint type, soil corrosivity and corrosion protection, seismic factors. The key factors for each water system would vary depending on the specific conditions and information available. For each category, rehabilitation and replacement rates are developed. This is done by analyzing historic failure data and historic rehabilitation and replacement data, and using expert estimates of the predicted life of newer mains.

In a typical model application, the user estimates the lifespan in years that 100 percent, 50 percent, and 10 percent of pipes in a given category are expected to reach without rehabilitation or replacement, although minimal spot repairs may be necessary. Table 9-5 shows the wide range of estimates for the lifespan of generic water main categories that were obtained from questionnaires during development of the model. The wide range is a reflection of the local conditions of each water utility, their experience with a particular pipe material, and the length of the historic record/experience.

***Table 9-5***
***Range of Water Main Life Expectancies from KANEW Questionnaire***

| Water Main Category | Range of Life Expectancy (years) | | |
|---|---|---|---|
| | 100% of pipes | 50% of pipes | 10% of pipes |
| Asbestos cement | 25 to 80 | 35 to 100 | 50 to 135 |
| Cast iron - unlined | 20 to 70 | 30 to 115 | 50 to 150 |
| Cast iron – lined (original) | 30 to 80 | 50 to 130 | 70 to 175 |
| Cast iron – lined (rehabbed) | 30 to 75 | 60 to 90 | 100 to 175 |
| Concrete | 30 to 100 | 40 to 150 | 60 to 200 |
| Ductile iron - unlined | 40 to 60 | 60 to 100 | 100 to 130 |
| Ductile iron – lined (original) | 30 to 100 | 50 to 150 | 90 to 200 |
| Ductile iron – lined (rehabbed) | 40 to 70 | 70 to 110 | 110 to 140 |
| PVC | 30 to 100 | 40 to 130 | 50 to 150 |
| Steel | 20 to 75 | 40 to 100 | 60 to 125 |

## 9.4 Recommendations

The City's current approach for determining the renewal & replacement cost component assumes that all water facilities will be replaced at the end of an assumed useful life. Table 9-1 gives CDM's suggested range of general assumptions for useful life. The useful life assumptions are subjective, and based on general assumptions rather than an evaluation of actual facility conditions.

In practice, it is likely that many facilities will be regularly maintained and rehabilitated as needed, which may be lower cost than replacement, e.g., relining pipelines rather than replacing. In addition, pipelines are typically only replaced if indicated by the leak/repair history in an area. Since pipelines comprise 75 percent of the annual depreciation value of the City's entire water system, this assumption greatly affects the anticipated future replacement and renewal costs.

For the City to get a more accurate estimate of future replacement costs, it would be beneficial to compile information on the actual condition of the key water system facilities, such as the type of information discussed in Section 9.3. This information could then be used to better estimate future renewal and replacement costs based on actual data, rather than subjective useful life assumptions.

Key criteria for evaluating the need for pipeline replacement appear to be: leak/repair history from the City's maintenance records; soil corrosivity and soil shrink-swell potential from Soil Surveys (available from Natural Resource Conservation Service, formerly Soil Conservation Service, in hard copy or electronic format depending on location). Leak/repair history appears to be the best indicator of future pipeline replacement needs. Historic leak/repair records could be managed in the City's GIS database, in order to identify locations or areas requiring frequent repair. Pipelines in those areas could then be evaluated for replacement.

Soil corrosivity is a key indicator of potential corrosion problems with metal pipe. Soil shrink-swell potential may be an indicator of the condition of rigid pipelines, such as ACP. Soils with a high shrink-swell potential may be subject to excessive soil movement that may potentially damage structures. Soils with high shrink-swell potential are also subject to ground movement by subsidence, creep and other forms of instability.

Another key criterion to consider is differentiating between types of facilities – critical/major and local/minor. For example, some water agencies differentiate between distribution pipelines (smaller diameter lines serving local areas) and transmission pipelines (larger diameter lines serving large areas). It is assumed that distribution pipelines would only be repaired/replaced if needed, i.e., that they would last indefinitely unless otherwise indicated by leak/repair history. The repair costs for these small pipelines are funded as part of the annual O&M budget, based on historic repair costs with some escalation built in for aging pipelines. It is assumed

that only transmission pipelines would be part of a systematic replacement program, as a preventive measure to avoid disrupting service to large numbers of people.

# Appendix A
# Hydraulic Model Assessment

## A.1. Modeling Assessment Overview

As part of the City of Pleasanton Master Plan Update, CDM reviewed available hydraulic modeling software to provide input for the City to select modeling software. This review was conducted in July 2001. Subsequently, the City selected the $H_2O$Map software. The software was purchased and used for the Master Plan evaluation, and will be provided to the City for future project use.

The hydraulic model used for previous master plans was developed as part of the 1985 Master Plan using the University of Kentucky's KYPIPE software. That model was converted to EPANET Version 1.1 for a water quality modeling evaluation performed in 1999. At the request of the City, the model review includes current versions of these previously used software packages. In addition, other commercially available hydraulic models were included in the software evaluation.

CDM met with the City and reviewed several topics, to assess those items most important to the City. Table A-1 summarizes important modeling issues identified by the City.

| ***Table A-1***<br>***Modeling Issues Identified in City Interview (June 2001)*** |
|---|
| ***Issues of Greatest Importance to the City***<br>• Ability to import from/export to GIS, and preserve linkage with GIS<br>• Ability to read/write ArcView shp files<br>• Graphical capabilities, especially ability to import different graphics backgrounds and display different outputs for different scenarios. The City would prefer a model that works within AutoCad, to take advantage of AutoCad's graphical import capabilities.<br>• Good scenario management to be able to keep track of scenarios and changes, and set up new scenarios easily.<br>• Good technical support |
| ***Issues of Relative Importance to the City***<br>• Open database structure for viewing/editing data using other software tools, such as Dbase or Excel, rather than proprietary format that cannot be viewed/edited except within the software, or by exporting data.<br>• Model speed<br>• Fire flow calculation tools<br>• Calibration tools |
| ***Primary Model Uses:***<br>• Most likely 1 to 2 people will use model on a semi-regular basis (4 to 6 times per year). A maximum of 4 people will use the model. Primary uses will be to assess new subdivisions and developments as they are approved, and operational evaluations. |

After meeting with the City, CDM prepared a preliminary modeling assessment, screening several available software packages. Section A.2 provides a general listing of available models included in the screening and CDM's opinions of each, based on CDM's direct experience in applying the models, where applicable. From this

discussion, a "shortlist" of three models was prepared, based on City modeling preferences.

Section A.3 presents additional details on the three models recommended for consideration by the City, using a more direct comparison of features and usability. Models were evaluated in five general areas, rating models on a 1 to 3 scale.

As part of the initial review, CDM did not include a specific model recommendation, nor did it rank or weight different categories where ratings were provided. Instead, CDM reviewed the results of the evaluation with the City, to receive City input in making a final model selection. Based on the review, the City elected to purchase the H2OMap software.

The reader should keep in mind that the hydraulic modeling industry is changing rapidly. The developers of these models keep track of what competitors are doing and each has a list of what will be available "in the next release." CDM developed this memorandum based on understanding of the features available in each package as it stands as of June 2001, and, where applicable, our own experiences with the models.

## A.2 Available Hydraulic Models

Over the last four years, CDM has conducted several model selection studies for utilities both in the United States and overseas. Table A-2 lists the models considered for these studies.

***Table A-2***
***Listing of Commercially Available Water Distribution Models Evaluated[1]***

| ***Company Name*** | ***Web Page URL*** | ***Model Name*** |
|---|---|---|
| The CEDRA Corporation | http://www.cedra.com/AVwater.html | AVwater |
| Haestad Methods, Inc. | http://www.haestad.com/software/watercad/default.asp | WaterCAD |
| MW Soft, Inc. | http://www.mwsoftinc.com/pro/prod.htm | $H_2$ONET, $H_2$OMap |
| SAFEGE | http://www.safege.fr/english/dom/logiciel/reseaux/piccolo/present.htm | PICCOLO |
| Stoner Associates | http://www.stoner.com/products/synergee_water.htm | SynerGEE |
| University of Kentucky | http://www.kypipe.com/pipe2000.html | PIPE2000 |

(1) If reading this in Word and computer is linked to the Internet, the hyperlinks shown in blue will link you to the model description page.

This section presents CDM's opinions on each of the models listed in Table A-2. In addition, CDM has included EPANET in its review because it has been used in previous City evaluations. EPANET is a non-commercial software available from the United States Environmental Protection Agency.

Where CDM has experience with a vendor, this has been included in our review. Otherwise, CDM has relied on information collected from vendors for prior

comparison studies. The next eight pages present one-page summaries for each of the models evaluated.

| ***CEDRA – AVwater*** |
|---|
| ***Overview*** |
| The CEDRA Corporation markets a variety of products that operate as extensions to the ArcView 3.x GIS products. One of these is CEDRA-AVwater. CEDRA-AVwater exists as a series of Avenue scripts that operate on ESRI shapefiles. The scripts perform various calculations that support hydraulic modeling, including creating input files for either the KYPIPE or EPANET hydraulic engines. |
| ***Compatibility with GIS Platform and Other Background Formats*** |
| The compatibility of AVwater with the City's existing and future GIS data should be excellent, since ArcView 3.2 GIS can read ARC/INFO coverages and/or ArcView shapefiles directly. A wide range of background data formats are supported through the native capabilities of ArcView 3.2 GIS, including AutoCAD .DXF files, Microstation .DGN files, and raster image formats such as .TIF. |
| ***Model Applicability to City of Pleasanton*** |
| In our opinion, the AVwater model is most suitable for periodic users of a water model. Both the demand management and scenario management capabilities appear to be inferior to those of most of the other models. The added overhead of ArcView 3.2 GIS software is probably not ideal for a production environment where many model runs will be performed. CDM also believes that the vendor support for AVwater will be substandard to that provided by competing products. |
| ***CDM Experience with CEDRA*** |
| Most of CDM's experiences with AVwater revolved around past attempts to review a trial version of the software. Although most vendors willingly provide trial versions, it took many reminders before CDM received a copy of the model. This trial version did not allow the models to be run, so none of the results analysis capabilities could be adequately reviewed. CDM has limited experience with CEDRA's closely related model, AVsand, for modeling of sanitary sewers. This experience has been mostly positive.<br>CDM had one existing international contract where CDM supplied and provided training on AVwater and AVsand. Our experience with the models on this project was less than promising.<br>CEDRA has the distinct advantage of being able to directly read native GIS data. In addition, AVwater, due to its underlying ArcView 3.2 GIS software, probably has the best overall support for display of different background file formats. AVwater appears to be the only model capable of producing plan and profile sheets, through ArcView 3.2 GIS' layout feature. |
| ***Avwater Disadvantages*** |
| In our opinion, AVwater likely has substandard demand management, scenario management, and results display capabilities compared to the "average" model reviewed. The model appears to be more suitable for periodic model updates and flow/pressure verification than for day-to-day production modeling. There does not appear to be widespread use of this model, based on our experience with other CDM clients. |
| ***Recommendation for AVwater*** |
| CDM recommends that the City exclude AVwater from further consideration. |

## *Haestad Methods – WaterCAD (formerly also called Cybernet)*

***Overview***

Haestad Methods markets a variety of products within the civil engineering profession. In our opinion, Haestad was an initial force behind the "new breed" of hydraulic model when they combined AutoCAD graphics with the KYPIPE hydraulic engine in the original Cybernet model. Haestad now markets a related set of models that fit the water distribution (WaterCAD), sanitary sewer (Sewer CAD) and storm sewer analysis (StormCAD) markets. WaterCAD can run as a stand-alone product or in conjunction with AutoCAD as the graphics engine. The stand-alone product was somewhat limiting in cartographic production capability compared to the AutoCAD version, as of Release 3. Aside from this, the look and feel of WaterCAD in the stand-alone or CAD environments is very similar, and in Release 4 (current), files can be shared between the two environments without conversion.

***Compatibility with GIS Platform and Other Background Formats***

The compatibility of WaterCAD with the City's existing and future GIS data should be above average. WaterCAD is capable of directly importing data via the ESRI shapefile format. WaterCAD can also "remember" connections to shapefiles and synchronize model data with a GIS data source. Background data in .DXF format can be imported directly. Use of the AutoCAD graphics engine will allow additional background capability.

***Model Applicability to City of Pleasanton***

In our opinion, the WaterCAD model is suitable for production or casual modeling environments. The demand management capabilities are better than average and the scenario management capabilities are good. The scenario management capabilities allow for "what-if" analyses. However, the model does not have a facilities manager to include or exclude different facilities from a model. Therefore, different time scenarios, such as existing and future conditions would probably be best managed setting up two different models.

***CDM Experience with Cybernet and WaterCAD***

CDM had a number of offices that moved to Cybernet 2.0 in the late 1980's. CDM has upgraded many of these installations to WaterCAD 3.0. CDM has had generally good experiences with the WaterCAD product.

CDM's experience with Haestad support has been fair. There is usually a delay of a couple of hours in receiving technical support. Haestad has a tendency to assume that any problem you experience is a result of your own mistakes. If pressed, Haestad will typically review a data file uploaded to their web site to assist with problem identification. The technical support is by experienced users who are generally helpful once engaged on a problem.

***WaterCAD Advantages***

WaterCAD will meet most, if not all, of the City's needs. The model is reasonably easy to learn and use and is very flexible. There are built-in features such as "Flex-Tables" and "Flex-Units" that allow individual users to change the fields displayed or the reported units on the fly.

In our opinion, the large icons on the control panel and the relatively small number of features make a good interface for the casual or periodic user of a water distribution model. Experienced or "production" users may find the complete package to be somewhat limited.

WaterCAD can also run with stand-alone graphics or in conjunction with AutoCAD so both AutoCAD and non-AutoCAD users can use the same model. As a result, the WaterCAD stand-alone and AutoCAD versions have the same general look and feel. The AutoCAD version costs approximately $5,000 more than the stand-alone version for the same number of pipes.

***WaterCAD Disadvantages***

The disadvantages of using WaterCAD primarily involve small quirks in the system. One such missing feature is the ability to graph more than one element at a time. For example, with most models, the user can graph the flow in any number of pipes or the pressure at multiple nodes, simultaneously, on a single graph. This allows the user to better understand relationships between different features of the same type. WaterCAD only allows one feature to be graphed at a time (although results for a given feature can be compared between scenarios on a single graph).

Haestad has also stuck with proprietary data storage for WaterCAD. This means that external programs can not be used to directly view and edit model data. However, from within the model, it is possible to link to various GIS and ODBC data sources to load model data or synchronize a model with an external database. Haestad believes that this is an advantage and prevents model corruption. CDM's preference would be for the data to be in a more readily accessible environment. The City has expressed this preference as well.

Although CDM has not performed benchmark tests against all other models, discussions with other users who have tested WaterCAD 3.0 suggest that the model is both slower than some competing models and is also more prone to convergence problems. Speed has been one of the major issues addressed in WaterCAD 4, and Haestad reports substantial improvements in both version 4.1 and version 4.5, the most recent release.

***Recommendation for WaterCAD***

CDM recommends that the City consider WaterCAD for implementation.

## *MW Soft, Inc. - $H_2$ONETand $H_2$OMAP*

***Overview***

MW Soft has created and aggressively marketed a top-notch water distribution model, $H_2$ONET, with a wide range of features that has been continually expanded. $H_2$ONET has been widely used beginning with Version 2.0. Version 2.0 was significantly easier to use than comparable offerings by other vendors at the time. Unfortunately, MW Soft's tendency to listen to all of its customers and build everything into the model has downgraded the ease of use for Version 3.0. $H_2$ONET uses AutoCAD as the graphics engine. The current release, Version 3.1, runs within AutoCad 2000.

In the past year, MW Soft has introduced a new product, $H_2$OMAP. This software package uses the same underlying modeling engine as $H_2$ONET, but has a stand-alone interface that accesses and stores data in native GIS format.

***Compatibility with GIS Platform and Other Background Formats***

The compatibility of $H_2$ONET with the City's existing and future GIS data would be well above average. The model is capable of importing data via ArcView 3.x GIS shapefiles. In addition to shapefile support, $H_2$ONET uses industry standard .DBF files to store model data. This should enhance the capability to interface model components with other systems.

The compatibility of $H_2$OMAP with the City's GIS data would be excellent, in our opinion. The model reads and stores information directly in shapefiles, as opposed to $H_2$ONET and other models that require that data be imported from shapefiles. This means that all of the data available in the shapefiles is accessible within the modeling environment.

$H_2$ONET is based on the AutoCAD graphics platform. Background data in .DXF format can be imported directly. Since most graphics packages are capable of producing .DXF files, most background data formats can likely be displayed behind $H_2$ONET data sets, with an extra translation step involved. Other formats such as TIF files can also be loaded through the AutoCAD interface.

$H_2$OMAP is a stand-alone interface that has a similar look and feel to ArcView. $H_2$OMAP would likely support the most flexibility in importing backgrounds, supporting a variety of file types including AutoCAD, Image Files and ArcView coverages.

***Model Applicability to the City***

In our opinion, the $H_2$ONET model is most suitable for high-end production modeling environments. Demand and scenario management capabilities are excellent. The model also includes a facilities manager, allowing facilities to be activated or de-activated for different scenarios. This is especially useful in evaluating future improvements, such as planned pipelines for a new development. The model also has many additional features, such as calibration and skeletonizing tools, some of which cost additional money. The model can be overwhelming and difficult for casual users of the system.

We have not had the opportunity to use $H_2$OMAP. Based on product literature and discussions with MW Soft, the primary difference of $H_2$OMAP is that it uses a GIS-based environment, rather than AutoCad, for performing model analysis, making it fully compatible with ArcView. The underlying modeling engine is the same as $H_2$ONET. Of the available add-on tools, $H_2$OMAP only supports use of the skeletonizing tool.

***CDM Experience with $H_2$ONET and $H_2$OMAP***

CDM has had very good experience with $H_2$ONET. CDM has found the support for $H_2$ONET to be excellent. In fact, several CDM concerns expressed to MW Soft were addressed in the next version of $H_2$ONET. As noted above, CDM has not used $H_2$OMAP, but would expect a similar high level of support for this product.

***$H_2$ONET and $H_2$OMAP Advantages***

$H_2$ONET or $H_2$OMAP should meet most, if not all, of the City's needs. The model is extremely flexible, fast, and the support is excellent. The model appears to have been developed and is supported by engineers with modeling experience, which is a great benefit. $H_2$OMAP would have the additional benefit of full compatibility with the City's GIS.

***$H_2$ONET/$H_2$OMAP Disadvantages***

The implementation of $H_2$ONET or $H_2$OMAP may result in one or two major disadvantages. The large number of button and menu options can be confusing, especially for users who only access the model periodically. CDM has existing clients who were trained in $H_2$ONET Release 2.0 and could not use the model a few months later. This problem is compounded in $H_2$ONET Release 3, which is considerably more difficult to use. Since $H_2$OMAP uses the same underlying modeling engine, its functionality and complexity are expected to be similar to $H_2$ONET. Additionally, production of to scale maps and drawings would likely be more difficult using $H_2$OMAP, since it is a stand-alone interface and doesn't make use of AutoCAD features specifically designed for producing scale drawings.

***Recommendation for* $H_2$ONET/$H_2$OMAP**

CDM recommends that the City consider $H_2$ONET or $H_2$OMAP for implementation.

| ***SAFEGE – PICCOLO*** |
|---|
| ***Overview*** |
| PICCOLO has been used sparingly in the United States but is used at about 140 client sites worldwide. It appears to be installed primarily where Safege has executed consulting work. It is Windows-based and supports broad ranging functionality in line with competing models. |
| ***Compatibility with GIS Platform and Other Background Formats*** |
| The compatibility of PICCOLO with the City's existing and future GIS is difficult to gauge. Links to ARC/INFO and ArcView appear to be project specific and not part of the basic package.<br>PICCOLO uses binary storage for data, which appears to be a proprietary format. Intermediate ASCII text files can be used as an import source to the database.<br>PICCOLO appears to be built on a proprietary graphics system as well. The software can import .DXF files for use as background data. Since most graphics packages are capable of producing .DXF files, most background data formats can likely be displayed behind PICCOLO data sets, with an extra translation step involved. |
| ***Model Applicability to City*** |
| We can not offer a definite opinion about the suitability of PICCOLO for production modeling, although it appears from the literature provided that it could meet most of the City needs.<br>The model does not appear to be capable of true scenario management with respect to different piping conditions - this can only be accomplished through the maintenance of multiple drawing files. |
| ***CDM Experience with PICCOLO*** |
| We do not know of any CDM users of the PICCOLO model. A list of users is available from the SAFEGE web site. There are only a handful of licensed users in the United States and 140 worldwide. |
| ***PICCOLO Advantages*** |
| CDM cannot adequately assess the advantages of this model based on the information provided on the web site or gathered for previous projects. While the model appears to have a few unique features, few of any of these would be beneficial to the City. |
| ***PICCOLO Disadvantages*** |
| The biggest disadvantage in the implementation of the PICCOLO model would be that it is an "unknown" commodity compared to the other models reviewed. No major limitations were identified from the literature provided. It is likely that support would have to be via E-mail due to time differences (based in France). |
| ***Recommendation for PICCOLO*** |
| The extremely limited user base in the United States suggests that PICCOLO is not worth pursuing. CDM recommends that the City exclude PICCOLO from further consideration. |

| Stoner Associates – SynerGEE |
|---|
| ***Overview*** |
| Stoner has marketed water distribution models for many years under different names, including LIQSS, LIQVARS, SWS-L and now SynerGEE. SynerGEE and its predecessors have been installed primarily at large client sites with many users. Our direct experience with model comparison studies suggests that SynerGEE is losing its limited market share in the United States to competing models, $H_2$ONET in particular. |
| ***Compatibility with GIS Platform and Other Background Formats*** |
| Stoner's SynerGEE model is an interesting competitor in the hydraulic modeling area. Stoner has tightly integrated SynerGEE with GIS through a middleware program called *MiddleLink*, which processes GIS data in its native format to create a distribution model that is executed and loaded back into the GIS environment.<br>SynerGEE is built on a proprietary graphics platform. Graphics allow the user to display the pipe and node network and there is reasonably good support for other formats, such as ArcView shapefiles. SynerGEE is marketed with water, gas and electric distribution models. |
| ***Model Applicability to City*** |
| In our opinion, the SynerGEE model is suitable for production modeling environments that want to concentrate on steady state solutions. Demand management is limited to 10 demand types. The model does not appear to be capable of true scenario management with respect to different piping or demand conditions - this can only be accomplished through the maintenance of network files. |
| ***CDM Experience with SynerGEE*** |
| CDM has limited experience with the SynerGEE model and with its predecessor, SWSL model. We have converted other databases and constructed other links to SWSL for a couple of our larger water utility clients. We also have some experience operating the model. The model is fast and stable for steady state analysis, but due to the lack of background data display capability with the former version and its very high cost relative to most commercially available models, CDM has only used SWSL when directed by a client for specific projects.<br>CDM has found the model to be quite unwieldy for extended period simulations, including water quality analyses.<br>Where we have used the model, we found technical support for the model to be excellent. |
| ***SynerGEE Advantages*** |
| SynerGEE is very tightly integrated with multiple GIS platforms through Stoner's MiddleLink interface. SynerGEE would meet most of the City of Pleasanton's modeling needs for steady state analyses, in our opinion. The model is very fast and stable, and can handle very large data sets if necessary (the model is not sold by number of pipes, so any number can theoretically be run). The model has reasonably good background file support and linkages to databases like Access. |
| ***SynerGEE Disadvantages*** |
| CDM believes that the SynerGEE model suffers from poor scenario management capability, and is difficult to use for extended period and water quality analyses. This model would likely require significantly more training and experience to apply effectively than competing models, in our opinion. Stoner has a relatively small user base for the water version of SynerGEE, especially in the United States, in part due to its relatively high cost. |
| ***Recommendation for SynerGEE*** |
| The limited user base in the United States combined with the high cost and usability problems suggests that SynerGEE is not a good option for the City. CDM recommends that the City exclude SynerGEE from further consideration. |

| University of Kentucky – PIPE2000 |
|---|
| ***Overview*** |
| The University of Kentucky (UK) probably has the longest running experience developing and distributing water distribution models. Their flagship KYPIPE package was developed in the late 1960's and early 1970's and was available commercially on mainframes and minicomputers by the late 1970's. With the advent of the personal computer in the early 1980's, KYPIPE became the model of choice for many jurisdictions and consultants around the globe. For many years, KYPIPE was the model of choice for water distribution modeling, despite its clunky ASCII file interface and poor graphics. By the late 1980's and early 1990's, KYPIPE began losing market share to Cybernet (later rename WaterCAD).<br>UK's latest release of the KYPIPE engine, PIPE2000, represents a giant step forward for UK. A new graphical user interface and database format has improved the model, along with a number of unique features. |
| ***Compatibility with GIS Platform and Other Background Formats*** |
| ArcView shapefiles can be imported as a model data source, although, when last tested, about a year ago, the interface was still a little buggy and difficult to use. Background file support is excellent. |
| ***CDM Experience with PIPE2000*** |
| CDM carried out many projects using the previous versions of KYPIPE. The hydraulic engine is relatively stable except for extended period simulations on complex networks with multiple pressure zones and pressure switches. The new PIPE2000 version was released before its time, in our opinion. The engine is slow compared to competing models, especially when full reporting is enabled. If a user has learned the many idiosyncrasies of the model, it is usable as a production tool for small jurisdictions. |
| ***PIPE2000 Advantages*** |
| The model has several unique and interesting features that may make it contend for a place as an engineering tool on most projects, if other problems are improved. Add-ins such as an automated calibration tool and design tool, which cost extra with other models, are built-in to the basic interface. The interaction between graphics and data is rather intuitive and easy to use. The model also can support in-line hydrants, valves and meters without breaking model pipes, a unique feature that allows for interesting analyses that are not possible with competing models. PIPE2000 also can account for degradation of C-values for future year runs. |
| ***PIPE2000 Disadvantages*** |
| Despite its many unique features and rather nice interface, the PIPE2000 model is plagued by poor planning in development. The selected database engine is based on Microsoft Excel and is therefore limited to 64,000 internal nodes, which includes pipe alignment points (this number was increased at CDM's insistence; the original version supported 16,000). There are many other minor and unexplainable annoyances with the model that must be put up with as UK struggles to correct them, such as the fact that color-coding pipes by a model output parameter (such as flow) greatly slows redisplays. The model also supports a limiting number of demand types (5) and is very poor in its scenario management and reporting capabilities. UK is working on improvements in many of these areas. |
| ***Recommendation for PIPE2000*** |
| CDM recommends that the City not consider PIPE2000 further. |

| ***EPANET*** |
|---|
| ***Overview*** |
| EPANET was first developed in the early 1990's, by the U.S. Environmental Protection Agency's Risk Reduction Engineering Laboratory in Cincinnati, OH. While earlier models, such as Cybernet, provided graphical capabilities within a DOS-based environment, EPANET was one of the first to integrate modeling capabilities with graphical display of results in the Windows environment. EPANET also was the first model to integrate water quality analysis with hydraulic analysis efficiently, making water quality analysis an extension of hydraulic modeling.<br>Because EPANET is a government-developed product, the model and code are available at no cost. Many of the commercial codes on the market have their roots in EPANET. The current release of EPANET is Version 2.0, released in 2000. |
| ***Compatibility with GIS Platform and Other Background Formats*** |
| EPANET does not have the capability to read shapefiles. Background display capability is limited to DXF files. The model has a stand-alone interface and reads and writes binary files that cannot be viewed or used directly by other software packages, without export, though text reports can be generated and model results can be cut and pasted to other Windows applications. |
| ***CDM Experience with EPANET*** |
| CDM has used EPANET occasionally, generally for comparative analysis with other models. CDM has found that model support is fair. While the EPA maintains an interest in supporting the model, code updates and changes are made only as staff time permits. |
| ***EPANET Advantages*** |
| The primary advantage of EPANET is that it is free. |
| ***EPANET Disadvantages*** |
| Most of the work spent by commercial software vendors is in providing new model features, such as scenario management, demand management, SCADA evaluation or other tools, or work on the interface to provide good graphical capability. Since the EPA's primary mission in developing the model has been to provide a good technical tool integrating hydraulic and water quality capabilities, the model does not begin to compare with commercially available software. The software has no scenario management capabilities, limited demand management capabilities, and generally limited graphical capabilities in comparison to commercially available models. In addition, there is no direct technical support of the model, and model updates and corrections are made only as EPA staff time permits. |
| ***Recommendation for EPANET*** |
| CDM recommends that the City not consider EPANET further. |

# A.3 Detailed Model Ratings

Based on the preliminary screening, CDM evaluated the following three software packages in more detail.

- WaterCAD by Haestad Methods, Inc.
- $H_2$ONET by MW Soft, Inc.
- $H_2$OMAP by MW Soft, Inc.

CDM developed relative ranking scores for comparison of model packages based on a number of criteria. The criteria include: Model Environment, GIS Compatibility, Model Setup, Model Modifications, Performing Analysis, Unique Features, Ease of Use and Technical Support. For each category, models were rated on a 1 to 3 scale, with a score of 3 being best. The following sections below describe the criteria and the ratings for each of the models. Table A-3 at the end of this section summarizes the ratings for each of the models.

## Environment

In interviews with the City, models that have good graphical capabilities, such as those models that run within the AutoCAD environment, were most desirable. Also, models with "open" architecture, storing data in databases that can be read by other applications, were also a plus.

$H_2$ONET runs within the AutoCAD environment. WaterCAD has both stand-alone and AutoCAD-based versions. In our experience with past versions of the model, the cartographic production capabilities are more limited in the stand-alone version, so the AutoCAD version would be preferable.

$H_2$OMAP runs within a stand-alone interface. CDM has not had the opportunity to use this product. However, in our opinion, given its similar look and feel to GIS software, it is likely more difficult to produce scale maps and drawings than within AutoCAD, which is specifically designed for this purpose.

$H_2$OMAP and $H_2$ONET both use the industry standard .DBF files to store model data, which should enhance the capability to interface model components with other systems. WaterCAD uses a proprietary data storage format, so data cannot be directly viewed using other programs. However, from within the model, data can be exported in different formats to view it within other software packages.

$H_2$ONET was assigned a rating of 3. $H_2$OMAP and WaterCAD were assigned a rating of 2.

## GIS Compatibility

In interviews with the City, the ability to read and write ArcView shapefiles was considered essential. The ability to import from and export results to GIS, preserving the linkage between the two is also important.

Each of the models selected for the detailed evaluation was chosen because they have the capability to use Arcview shapefiles. WaterCAD and $H_2$ONET both have the capability to import information from shapefiles. In each instance, an intermediate step is involved to map the data fields from the file to the model to transfer information to the model. $H_2$OMAP makes use of the shapefiles to store graphical model data, eliminating the intermediate step involved to bring data into the model. Additionally, outputs from $H_2$OMAP can be viewed within $H_2$OMAP, or within GIS software.

$H_2$ONET has available tools that can be used to check and fix GIS data for use in the model. Similar processing tools are not available in WaterCAD.

$H_2$OMAP was rated 3 in this category, because it works with shapefiles directly, facilitating the exchange of GIS-based data and has tools to facilitate checking and fixing GIS data for modeling purposes. $H_2$ONET was rated 2 in this category because an intermediate step is required to import or export data and because processing tools are available to check and fix GIS data for modeling purposes. WaterCad was rated 1 in this category, because an intermediate import or export step is required and no tools are available to process GIS data.

## Model Setup

This category attempts to rank the three models for the ease with which new models can be created. Although there are many different aspects and data-related elements of model creation, three are typically the most critical to successful water model development: data set (pipe/node) import/layout capability, background file display capability, and demand import capability. Model setup, in general, is of less importance to the City, since model updates are expected to be limited to adding pipelines for new subdivisions, to evaluate the adequacy of planned water system improvements.

Layout of new systems is approximately equivalent in all three models. WaterCAD has the ability to "morph" a feature to a different type of feature. Since $H_2$ONET and WaterCAD work within AutoCAD, snapping and alignment tools during layout are superior.

$H_2$ONET and WaterCAD are limited to the formats that AutoCAD can read directly, including .DXF and TIF. Both models can also be run within AutoCAD Map, which supports a wide variety of background display formats including orthophotos and other raster formats, AutoCAD .dwg and dxf formats, MapInfo MID format and ArcInfo coverages. $H_2$OMAP also supports these formats.

Demand import capabilities are important because demand information changes continuously. It is important for the models being considered to be capable of bulk loading new demand information. Also, it is important that both the demand volume and pattern (indicative of customer type) can be bulk-loaded. $H_2$ONET and $H_2$Omap are superior models in this category. The model can load demands and patterns using various import options, including tab-delimited, comma separated values or text files that can easily be generated in other programs, such as Excel. While WaterCAD has no limitations on the number of demands, it is currently not possible to bulk load patterns to the model. This is troublesome for creating and updating new models with multiple demand types where different patterns are required. This is not a big issue for the City, since data are not available to generate a large number of use patterns.

$H_2$OMAP and $H_2$ONET are rated 3 in this category. WaterCAD is rated 2 in this category.

## Model Modifications

The term model modifications refers to the ease with which changes can be made to the model to carry out what-if scenarios, or to create major versions of the model to be used for specific purposes. Four subcategories were created to evaluate this category. These include:

1. The ease with which basic model changes can be made, such as quickly changing a diameter or tank overflow level. End users will find many cases where they will want to quickly make a change, check the effect, and then undo the change.

2. The ease with which new scenarios can be created. A scenario refers to the capability of the models to store and analyze multiple conditions for the same basic network. Scenarios might be used, for example, to compare results for several alternative alignments and sizes for a proposed water main extension to a new service area.

3. The ease with which wholesale skeletonization of the network can be carried out. Skeletonization refers to the process of simplifying the network to include only the larger transmission mains. Skeletonization is frequently carried out to reduce the number of pipe segments in a model for faster processing.

4. The ease with which entire pressure zones can be separated from the overall model and handled individually. This process has the same general effect as skeletonization, but usually leaves full detail for a specific area of the water distribution model.

***Making Model Changes***

Changes to the underlying model data are rather easily carried out on all three platforms being considered. WaterCAD offers better direct integration between

graphics and data and is therefore rated 3 in this subcategory. $H_2$ONET and $H_2$OMAP are rated 2.

***Scenario Management***
$H_2$ONET, $H_2$OMAP and WaterCAD all offer true scenario management in the form of sophisticated parent-child tree inheritance schemes. These are excellent for evaluating multiple what-if scenarios if the user is not pressed for time, as set-up is more time consuming than simply changing a value and comparing results. In reviewing current software, scenario managers are virtually identical between the different models.

In addition to a scenario manager, $H_2$ONET and $H_2$OMAP also include a facilities manager, that allows the user to activate or de-activate selected facilities for a particular scenario. This is particularly useful for evaluating future what-if scenarios, where the user may want to evaluate the sizing of new facilities, for example new pipelines for a proposed subdivision, but not necessarily include these facilities as part of the existing facilities model, since they are not yet constructed. In $H_2$ONET, facilities that are not active for a particular scenario are not part of the model data set and do not appear on the screen. In WaterCAD, these facilities would display on the screen and would be active in all scenarios, and pipes would have to be closed if the user did not want pipes to be used.

$H_2$ONET and $H_2$OMAP were rated 3 in this category. WaterCAD is rated 2.

***Skeletonization***
In terms of skeletonization, both $H_2$ONET and $H_2$OMAP can extract a portion of the network above a certain diameter, for example. This is accomplished using the DOMAIN tools in either model. The process involves creating a new domain, and then performing an export/import to reduce the data set. WaterCAD has a similar tool to create "Selection Sets" which are collections of facilities, selected based on specific criteria. Selection sets can be exported to modify the dataset. MW Soft has an add-on skeletonization utility that costs additional money that can be used with either $H_2$ONET or $H_2$OMAP. All three models are rated 2 for skeletonization capability, based on the basic model capabilities, without add-on software.

***Pressure Zone Extraction***
Pressure zone extraction, as opposed to skeletonization, is relatively easy with all three models. With $H_2$ONET, the user can utilize the AutoCAD polygon tool to delineate an area for deletion and thereby cut out all of the features outside of a pressure zone. WaterCAD can accomplish this bulk deletion through identification of rectangular areas or individual segments. In each case, these tools would be used to create a new drawing file that would become a new model for that portion of the system.

Where the models differ is in the ability to select a subset of the model and run an analysis on only that portion of the model, without having to delete numerous

facilities. For example, it may be desirable to isolate a single pressure zone and perform an evaluation only for that pressure zone. In $H_2$ONET and $H_2$OMAP, the Domain and Facility Manager tools can be used to create a dataset containing only facilities in the area of interest and a model evaluation can be performed for only those facilities. All other facilities are still in the model, but de-activated. In contrast, WaterCAD has no facility manager to isolate and selectively run only a portion of the system.

$H_2$ONET and $H_2$OMAP were rated 3 for this category. WaterCAD was rated 1.

## Performing Analyses

Much of the daily interaction with the model will be in performing a variety of analyses and in interpreting the results. It is therefore important that the user can easily extract pertinent results from the model by a variety of means, and that the model simulation speed be acceptable for daily use. Subcategories analyzed include model simulation speed, report control and flexibility, and graphical output capabilities (graphs, profiles, etc.).

CDM has previously benchmarked $H_2$ONET and WaterCAD for other clients, with $H_2$Onet being faster. However, WaterCAD has made significant improvements to speed in its release 4. Based on our experience with other models, model speed is not likely to be an issue with hydraulic analysis. It will be more important for water quality analysis, where model run times of several hundred hours may be required to be able to evaluate water quality trends. We have not benchmarked similar models using current versions of these software packages, so we did not rate the models on speed.

Report control in WaterCAD and $H_2$ONET is reasonably flexible. Reports can be pulled up and customized, and even units can be changed on the fly. Both packages can dump report data into a third-party package such as Excel. $H_2$OMAP capabilities are similar to $H_2$ONET.

The models were rated equally in this category, all receiving a 3.

Graphic outputs are excellent with all three of the models. All can color code pipes and junctions based on preset or custom criteria. All models "memorize" previous settings so one can switch back and forth between result types. Contouring is available in all three packages as well. Graphing and profile views of hydraulic grade line are also available. The graphing capabilities present the most striking differences in the models. While all three can compare results for a given pipe or junction for multiple scenarios, only WaterCAD cannot graph multiple elements on a single graph. CDM engineers have found this capability to be very important for analysis, and its lack in the current version is a significant detriment to WaterCAD, in our opinion. $H_2$ONET and $H_2$Omap were each rated 3 in this category. WaterCAD was rated 2.

## Unique Features

This category attempts to cover the unique features that may be present in one model but not others, ranked by how often the capability may be used by the City of Pleasanton. The City expressed most interest in calibration and fire flow evaluation tools. The categories used are based partially on model literature and CDM has assumed that the model claims are legitimate (not all functions were tested). The items include:

- Net positive suction head (NPSH) calculation
- System head curve creation
- Pump energy cost calculation
- SCADA linkage
- Water quality capabilities (age, trace, constituent)
- Automated fire flow calculations
- Valve isolation tool
- Calibration tool
- Design (constraint) tool

$H_2$ONET supports all of these functions, but the last three are add-on components that increase the price of the model rather than in the basic package. These add-ons have not yet been developed for $H_2$OMAP. WaterCAD supports SCADA linkage, water quality analysis, and automated fire flow calculations. $H_2$ONET is rated 3 for this category; $H_2$OMAP is rated 2 and WaterCAD is rated 1.

## Ease of Use

This category does not have any breakdown into specific aspects of use. Rather, it is a reflection of CDM's overall user experience and work with utility-based end-users. The ranks assigned reflect the author's opinion of how easily City staff will be able to learn and apply the model, both for "power" users and periodic or casual users of the model. WaterCAD is a more navigable and understandable model for novices (though not perfect) and was rated a 3 in this category. $H_2$ONET and $H_2$Omap were rated a 2 due to the myriad buttons and menus, and features that are difficult to find. These models do not feature as many point and click options as WaterCAD, requiring all features to be accessed through menus or toolbars.

## Support

The support category covers the quality of phone support, web-site support including options for upload and download of upgrades or files, and whether the product can expected to remain "state-of-the-art." All three companies offer decent web-site support and upgrades can be downloaded and installed rather easily. Phone support for $H_2$ONET has been excellent, in CDM's experience. Support for $H_2$OMAP is expected to be similar, since the same staff would be handling technical questions on this product.

Support for WaterCAD is good, but not quite as good as that for $H_2$ONET. An attendant always answers WaterCAD calls but the user must sometimes wait for a return call if support personnel are busy. Haestad has recently introduced an array of model technical support options, where customers willing to pay more can get quicker response. CDM is not enrolled in the higher fee support options, so cannot judge the effectiveness of this.

$H_2$ONET and $H_2$OMAP were rated a 3 in this category. WaterCAD was rated a 2.

## Summary

Table A-3 totals the non-cost scores for each model. These scores are based on the rankings of 1 to 3 discussed previously, with a score of 3 being best.

***Table A-3***
***Non-Cost Scoring of H2Onet, H2Omap and WaterCAD***

| *Consideration* | *$H_2$ONET* | *$H_2$OMAP* | *WaterCAD* |
|---|---|---|---|
| Environment | 3 | 2 | 2 |
| GIS Compatibility | 2 | 3 | 1 |
| Model Setup | 3 | 3 | 2 |
| Model Manipulation | | | |
| Basic Changes | 2 | 2 | 2 |
| Scenario Management | 3 | 3 | 2 |
| Skeletonization | 2 | 2 | 2 |
| Pressure Zones | 3 | 3 | 1 |
| Model Analyses | | | |
| Tabular Output | 3 | 3 | 3 |
| Graphical Output | 3 | 3 | 2 |
| Special Features | 3 | 2 | 1 |
| Ease of Use | 2 | 2 | 3 |
| Support | 3 | 3 | 2 |

## Cost Comparison

Vendor price lists and quotations were used to determine the approximate cost to the City of procuring the water modeling software. Haestad provided a quotation, good through mid-July 2001 that was discounted about $5,000 from its web-based list price.

It is anticipated that this price availability could be extended, since their quoted price is similar to discounts offered in promotional literature.

Based on the initial assessment of modeling data, the City would need an 8000-pipe license if the system is not skeletonized. CDM estimates that a 4000-pipe license would be needed if the system is skeletonized.

MWSoft provides modeling software in 1000-pipe increments, from 1000 to 10,000 pipe models. CDM found that Haestad has only 1000-pipe, 2000-pipe, 5000-pipe and 10000 pipe licenses. Therefore costs are based on a 4000-pipe and 8000-pipe for $H_2$ONET or $H_2$OMAP and a 5000-pipe or 10000 pipe license for WaterCAD.

Prices include one year of technical support. MW Soft offers the first year of technical support free, and charges $500 per year for subsequent years. Haestad provides a number of technical support options. The lowest level of support has no annual fee for one year after model purchase, but requires a per-use payment of $195 per technical support and has up to a one-day turn around time. The highest level of support has an initial one-year cost of 10 percent of the software purchase price, but free access to technical support and "immediate" turnaround. Haestad also quoted a price for three years of technical support (purchased at time of model purchase) at 20% to 40% of the model cost for the lowest and highest level options. Costs are summarized in Table A-4.

**Table A-4**
**Comparison of Model Costs (June 2001)**

| Cost Component | $H_2$ONET and $H_2$OMAP | | WaterCAD | |
|---|---|---|---|---|
| Model Size: | 4000 pipes | 8000 pipes | 5000 pipes (1) | 10000 pipes (1) |
| Cost for single license | $7,600(3) | $11,900(3) | $ 11,995 | $ 15,995 |
| Maintenance Fee (one year) | $0 | $0 | $0-$1,199 (2) | $0-$1,599 (2) |
| Total for license and one year technical support | $7,600 (3) | $11,900 (3) | $11,995-$13,194 | $15,995-$17,594 |

(1) Model sizes closest available to City needs
(2) $0 option requires fee of $195 per technical support call.
(3) Prices shown include California sales tax.

# Appendix B
# Detailed Future Demand Projections

Future demands were estimated for a number of different land use types including residential (single family and multi-family), commercial (various types), parks and schools. Average daily demand is expected to increase by about 2,800 gpm (4.1 mgd) by buildout. Of this total demand, about half is for new residential development and half is for other uses. This appendix describes the methodology CDM used to estimate future demands for the City of Pleasanton Water Master Plan Update.

## B.1 Residential Demand Projections

To estimate future residential demands, CDM developed eighteen different residential unit water use rates and applied these to 95 future residential development projects identified by the City of Pleasanton. A wide variety of residential unit water use rates were used to accurately characterize the different types of residential development that are expected to occur, from apartments to large, landscaped single-family properties.

Table B-1 summarizes the information used to estimate future residential demands. The calculation procedure is outlined below.

- The City identified 14 groups of existing customers whose billing records were to be used to establish water use rates. Each sample group is located in a single area, typically within the same subdivision. The location of each sample group is listed in Table B-1 by street name, or by subdivision name if known. The size of the sample groups ranges from 3 parcels to 314 parcels.

- CDM used the City's Utility Billing Database to establish existing water use by each customer in the sample groups. The average water use rate (demand per parcel) was calculated for each sample group.

- The City provided a map and list of 95 planned future residential development projects, including the number of future parcels for each development. In most cases, the City also identified which sample group was to be used for each future development. Table B-1 associates a list of future projects with each sample group, thereby establishing a water use rate for each project.

- For some future development projects, the City did not identify a sample group to establish water use rates. For these cases, CDM estimated an appropriate water use rate based on the characteristics of the development – apartments, small single family properties, large single family properties, etc. -- using similarly sized properties elsewhere in the City. This approach was used for sample groups Q, R, S, & T in Table B-1.

**Table B-1**
**Projections of Average Day Demands for Future Residential Development**

| Sample of Existing Demands | | | | Demand Estimate for Future Development | | | | |
|---|---|---|---|---|---|---|---|---|
| **Sample Group Code** | **Location of Sample Group** | **No. of Parcels Sampled** | **Demand per Parcel (gpm)** | **Project/Property Name** | **Location** | **No. of Parcels** | **Zone** | **Projected Demand** |
| A | Horizon Ct., Serenity Terr., Foothill Rd., Bethel Ln. | 12 | 0.99 | Hempy / Starnes | 5016 Foothill Rd | 1 | Moller Lower | 1.0 |
| | | | | Moller Ranch | Foothill Rd at Serenity Terr. | 9 | Moller 770 | 8.9 |
| | | | | Thomas | 8053 and 8093 Bethel Lane | 2 | Moller 770 | 2.0 |
| | | | | Schaeffer | 7852 Perry Ln | 1 | Moller Lower | 1.0 |
| | | | | Starnes property | 5050 Foothill Rd | 1 | Moller Lower | 1.0 |
| B | Jorgensen Ln, Foothill Oaks Terr., Deer Oaks Dr., Twelve Oaks Dr. | 41 | 0.70 | Olesen property | 2776 Foothill Rd | 1 | Deer Oaks | 0.7 |
| | | | | McCarthy property | 2768 Foothill Rd | 1 | 510 | 0.7 |
| C | Villa Loop | 113 | 0.22 | Bernal "Eastern Parcel" | Case Ave. (south end) | 128 | Lower | 27.6 |
| D | Golden Eagle Farm | 76 | 1.07 | Upper Longview | 9900 Longview Dr | 1 | 770 | 1.1 |
| | | | | Golden Eagle Farm | Foothill Rd at Golden Eagle Wy. | 7 | Lower 770 | 7.5 |
| | | | | Golden Eagle Farm | Foothill Rd at Golden Eagle Wy. | 6 | 770 | 6.4 |
| | | | | Maroon Creek Limited Partnership | 2188 Foothill Rd | 11 | 770 | 11.8 |
| E | Foothill Rd, War Glory Pl, Mares Ct., Rockford Pl, Sassafras Ct. | 28 | 1.10 | Oak Tree Acres | Foothill Rd | 5 | Foothill 770 | 5.5 |
| | | | | Oak Tree Farm | Foothill Rd at Oak Tree Farm Dr. | 14 | Foothill 770 | 15.4 |
| | | | | Hallgrimson property | 369 Oak Ln | 1 | Foothill 770 | 1.1 |
| | | | | Sladen property | 7637 Foothill Rd | 4 | Foothill 770 | 4.4 |
| | | | | Himsl property | 7661 Foothill Rd | 2 | Foothill 770 | 2.2 |
| | | | | Paulson property | 409 Oak Ln | 2 | Foothill 770 | 2.2 |
| | | | | Jachau property | Country Ln | 5 | Foothill 770 | 5.5 |
| | | | | Patel property | 7749 Country Ln | 2 | Foothill 770 | 2.2 |
| F | Ridell St., Arlington Dr., Amber Ln., Hamilton Way | 126 | 0.59 | Thompson | 6240 Sunol Blvd | 2 | Lower | 1.2 |
| | | | | Castlewood Heights | Sunol Blvd | 29 | Lower | 17.0 |
| | | | | Carriage Gardens | Arlington Dr | 6 | Lower | 3.5 |
| G | Summit Creek Ln, Hidden Creek Ct., Selena Ct., Sycamore Creek Way | 32 | 0.39 | Busch property | Mohr Ave | 358 | Lower | 138.5 |
| | | | | Kolb | Dublin Canyon Rd | 12 | Lower | 4.6 |
| | | | | Lemoine | 4456 Foothill Rd | 12 | 510 | 4.6 |
| | | | | Bernal "Western Parcel" (Greenbriar) | I-680 (west side) @ Bernal | 232 | Lower | 89.7 |
| | | | | Fuller/Frades | 4120 Foothill Rd | 2 | New(1) | 0.8 |
| | | | | Bozorgzad | 488 Sycamore Rd | 3 | Lower | 1.2 |
| | | | | Sycamore Heights | Sycamore Rd | 48 | Bonde | 18.6 |
| | | | | Bringhurst | 990 Sycamore Rd | 2 | Bonde | 0.8 |
| | | | | TTK Partnership | Happy Valley Rd | 12 | Bonde | 4.6 |
| | | | | City Golf Course | Happy Valley Rd | 34 | Bonde | 13.1 |
| | | | | Panganiban | 11115 Dublin Canyon Rd | 6 | Moller 770 | 2.3 |
| | | | | Bridle Creek | Sycamore Rd | 71 | Bonde | 27.5 |
| | | | | Westbrook | 10890 Dublin Canyon Rd | 4 | Dublin Canyon | 1.5 |
| | | | | Shriners Hospital property | Dublin Canyon Rd | 12 | Dublin Canyon | 4.6 |
| | | | | Lester property | Dublin Canyon Rd | 31 | Dublin Canyon | 12.0 |
| | | | | Lester property | 11033 Dublin Canyon Rd | 11 | Dublin Canyon | 4.3 |
| | | | | Pleasant View Church of Christ | 11300 Dublin Canyon Rd | 3 | Dublin Canyon | 1.2 |
| | | | | Lewis property | 13301 Dublin Canyon Rd | 1 | Dublin Canyon | 0.4 |
| | | | | Gandolfo property | 11021 Dublin Canyon Rd | 3 | Moller 770 | 1.2 |
| | | | | Swartz property | 50 Tehan Canyon Rd | 8 | New(1) | 3.1 |
| | | | | Joel property | 25 Tehan Canyon Rd | 5 | New(1) | 1.9 |
| | | | | Lemoine - Upper Lot | 4456 Foothill Rd | 3 | New(1) | 1.2 |

**Table B-1**
**Projections of Average Day Demands for Future Residential Development**

| Sample of Existing Demands | | | | Demand Estimate for Future Development | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Group Code | Location of Sample Group | No. of Parcels Sampled | Demand per Parcel (gpm) | Project/Property Name | Location | No. of Parcels | Zone | Projected Demand |
| G | Summit Creek Ln, Hidden Creek Ct., Selena Ct., Sycamore Creek Way | 32 | 0.39 | Yee Property | Foothill Rd | 10 | 510 | 3.9 |
| | | | | Lue property | 3984 Foothill Rd | 3 | Kilkare | 1.2 |
| | | | | Merritt property | 4141 Foothill Rd | 42 | Lower | 16.2 |
| | | | | Lund Ranch II property | Lund Ranch Rd | 86 | Bonde | 33.3 |
| | | | | Barr property | 3370 Little Valley Rd | 3 | Bonde | 1.2 |
| | | | | Hubbard/Kohne/ Pettipiece/Zavoli | 3401-3875 Little Valley Rd | 8 | Bonde | 3.1 |
| | | | | N. Sycamore Spec. Plan | Sycamore Road | 30 | Lower | 11.6 |
| | | | | N. Sycamore Spec. Plan | Sycamore Road | 43 | Bonde | 16.6 |
| | | | | Happy Valley Spec. Plan | Happy Valley | 248 | Bonde | 95.9 |
| H | Bonde Ranch | 56 | 0.42 | Bonde Ranch | Bernal Ave | 8 | Bonde | 3.3 |
| J | Kottinger Ranch | 142 | 0.70 | Kottinger Ranch | 4209 Grant Ct | 1 | Kottinger Ranch | 0.7 |
| | | | | Kottinger Hills/Lin property | Hearst Dr | 98 | Kottinger Ranch | 68.4 |
| K | Foxborough Pl., Gray Fox Cir./Ct, Roman Eagle Ct., Grey Eagle Ct., Red Feather Ct., Eaglet Ct. | 74 | 0.86 | Beratlis | Crestablanca Dr | 14 | Bonde | 12.1 |
| | | | | Costas | 2503 Vineyard Ave | 6 | Bonde | 5.2 |
| | | | | Delco | Clara Ln | 25 | Bonde | 21.6 |
| | | | | Hahner | 2287 Vineyard Ave | 30 | Vineyard | 25.9 |
| | | | | Centex Apperson | 2200 Vineyard Ave | 17 | Vineyard | 14.7 |
| | | | | Centex Avignon | 1689 Vineyard Ave | 47 | Vineyard | 40.6 |
| | | | | Victoria Meadow | 2834 Victoria Ridge | 1 | Bonde | 0.9 |
| | | | | Foxborough Estates | 802 Gray Fox Circle | 1 | Bonde | 0.9 |
| | | | | Grey Eagle | 24 Grey Eagle Ct | 1 | Grey Eagle | 0.9 |
| | | | | Vineyard Corr. Spec. Plan | Vineyard Corridor | 83 | Vineyard | 71.6 |
| L | Ruby Hill | 314 | 0.98 | Ruby Hill | Vineyard Ave | 276 | Ruby Hill Upper | 270.8 |
| | | | | | | 63 | Ruby Hill Lower | 61.8 |
| M | Picard Ave., Newton Way, Wilde Ave. | 34 | 0.62 | Lauer | 2221 Martin Ave | 5 | Lower | 3.1 |
| | | | | Jennaro | 3727 Mohr Ave | 5 | Lower | 3.1 |
| | | | | Peterson property | 2201 Martin Ave | 1 | Lower | 0.6 |
| | | | | Singleton property | 2207 Martin Ave | 1 | Lower | 0.6 |
| | | | | Gonsalves property | 2215 Martin Ave | 1 | Lower | 0.6 |
| | | | | Lehman property | 3757 Trenery Dr | 13 | Lower | 8.1 |
| | | | | Wiemken property | 3737 Trenery Dr | 1 | Lower | 0.6 |
| | | | | Larson property | 3711 Trenery Dr | 1 | Lower | 0.6 |
| | | | | Selway property | 2313 Martin Ave | 4 | Lower | 2.5 |
| N | Rose Ln. | 3 | 0.52 | Rich Aner / Calico | Rose Ave | 9 | Lower | 4.7 |
| | | | | Nolan Farm | 1015 Rose Ave | 36 | Lower | 18.6 |
| | | | | Hoile (Alteri/Marshall) | 1851 Rose Ave | 30 | Lower | 15.5 |
| | | | | Jansen (Thompson) | 1777 Rose Ave | 14 | Lower | 7.2 |
| | | | | Jones | 1725 Rose Ave | 20 | Lower | 10.4 |
| | | | | Jansen (Davidson) | 1635 Rose Ave | 4 | Lower | 2.1 |
| | | | | Zeisse | 1550 Rose Ln | 1 | Lower | 0.5 |
| P | Monaco Dr./Ct., Dolores Dr., Puerto Vallarta, Los Rio Ct. | 116 | 0.46 | Mission Park | 5766 San Carlos Way | 1 | Lower | 0.5 |
| | | | | Heritage Lane | 300 Neal St | 2 | Bonde | 0.9 |
| | | | | Auf Der Maur property | 4534 Bernal Ave | 49 | Bonde | 22.7 |
| Q | Apartments throughout City | - | 0.2 | Bernal "Central Parcel" (KB Homes) | I-680 (east side) @ Bernal | 100 | Lower | 20.0 |
| | | | | Central Downtown Multi-Family | Downtown | 25 | Lower | 5.0 |
| | | | | Auf Der Maur property | 3909 Vineyard Ave | 41 | Lower | 8.2 |
| R | Other Large Single Family properties throughout City | - | 0.75 | Walsh | 447 Kottinger Dr | 2 | Bonde | 1.5 |

**Table B-1**
**Projections of Average Day Demands for Future Residential Development**

| Sample of Existing Demands | | | | Demand Estimate for Future Development | | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Group Code | Location of Sample Group | No. of Parcels Sampled | Demand per Parcel (gpm) | Project/Property Name | Location | No. of Parcels | Zone | Projected Demand |
| S | Rose Ln., Monaco Dr./Ct., Dolores Dr., Puerto Vallarta, Los Rio Ct. (Average of Sample Groups N and P) | - | 0.5 | Roman Catholic Bishop of Oakland | 4001 Stoneridge Dr | 18 | Lower | 9.0 |
| | | | | Remen Tract | Vineyard Ave/Linden Wy | 80 | Lower | 40.0 |
| T | Other Small Single Family properties throughout City | - | 0.4 | Bernal "Central Parcel" (KB Homes) | I-680 (east side) @ Bernal | 121 | Lower | 48.4 |
| | | | | Vineyard Square | 4089 Vineyard Ave | 1 | Lower | 0.4 |
| | | | | Esperson | 4264 First St | 3 | Lower | 1.2 |
| | | | | New Life Fellowship | 3200 Hopyard Rd | 22 | Lower | 8.8 |
| **Total:** | | | | | | **2869** | | **1495.5** |

(1) **New zone is between existing 770 and Moller zones, and at a higher elevation.**

- CDM calculated average day demands for each future development, shown in the last column of Table B-1. Average day demands were then increased by 8.5% to account for distribution system losses. Table B-1 shows the demands before adjustment for distribution system losses.

- Estimated future demands were added to the hydraulic model. For some development projects, especially in outlying areas, demands were added at a single node. For other development projects (e.g., Ruby Hill), demands were distributed among many nodes.

## B.2 Commercial Demand Projections

The City of Pleasanton staff provided CDM with unit water use factors for approximately 85 future commercial projects in eighteen categories (retail, service, restaurants, etc.). These unit water use factors are listed in Table B-2.

Table B-3 summarizes all future commercial development projects identified by the City and the projected demand associated with each. The total future commercial demand is 455 gpm. These

**Table B-2**
**Unit Water Use Factors for Future Commercial Development**

| Development Type | Unit Water Use Factor (gpd/ft$^2$) |
|---|---|
| Admin/Office | 0.05 |
| Auto Sales& Rental | 0.05 |
| Financial Institution | 0.1 |
| Industrial/Service | 0.08 - 0.09 |
| Industrial | 0.09 |
| Light Manufacturing | 0.09 |
| Medical | 0.17 |
| Office | 0.05 |
| Promotional | 0.07 |
| Public & Institutional | 0.16 – 0.162 |
| R & D/Light Manufacturing | 0.07 |
| Restaurant | 0.61 |
| Retail | 0.07 |
| Self Storage | 0.01 |
| Service | 0.08 |
| Warehouse | 0.03 |
| Winery Use | 0.07(1) |
| Winery/ Barrel Storage | 0.24 |

(1) Calculated by CDM based on existing consumption database.

demands were increased by 8.5 percent, to account for distribution system losses, and assigned to the hydraulic model, based on their anticipated locations.

**Table B-3**
**Average Day Demands for Future Commercial Development**

| Project Name or Site Address | Land Use | Development Designation | Pressure Zone | Bldg. Size (Sq. Ft.) | Water Use Rate (gpd/ft$^2$) | Average Day Demand (gpm) |
|---|---|---|---|---|---|---|
| 11991 Dublin Canyon Rd. | Office | Vacant | Lower | 32,017 | 0.05 | 1.11 |
| 6110 Stoneridge Mall Rd. | Office | Vacant | Lower | 175,000 | 0.05 | 6.08 |
| Stoneridge Dr. | Medical | Vacant | Lower | 168,248 | 0.17 | 19.86 |
| 7028 Commerce Cir. | Light Mfng. | Vacant | Lower | 12,423 | 0.09 | 0.78 |
| Johnson Drive | Light Mfng. | Vacant | Lower | 31,193 | 0.09 | 1.95 |
| 6177 Sunol Blvd. (Applied Biosystems) | Office | Vacant | Lower | 960,000 | 0.05 | 33.33 |
| 1030 Happy Valley Rd. | Office | Vacant | Lower | 73,028 | 0.05 | 2.54 |
| Old Bernal Ave. | Office | Vacant | Lower | 47,415 | 0.05 | 1.65 |
| 5502 Sunol Blvd. | Office | Vacant | Lower | 7,775 | 0.05 | 0.27 |
| 5791 Sonoma Dr. | Light Mfng. | Vacant | Lower | 9,453 | 0.09 | 0.59 |
| 5779 Sonoma Dr. | Light Mfng. | Vacant | Lower | 7,832 | 0.09 | 0.49 |
| 5998 Sunol Blvd. | Office | Vacant | Lower | 11,434 | 0.05 | 0.4 |
| Sycamore Rd. | Office | Vacant | Lower | 13,200 | 0.05 | 0.46 |
| Sycamore Rd. | Office | Vacant | Lower | 13,000 | 0.05 | 0.45 |
| 201 Old Bernal Ave. | Office | Vacant | Lower | 4,950 | 0.05 | 0.17 |
| 3944 Old Santa Rita Rd. | Service | Vacant | Lower | 9,453 | 0.08 | 0.53 |
| 3640 Old Santa Rita Rd. | Service | Vacant | Lower | 20,908 | 0.08 | 1.16 |
| 1024 Santa Rita Rd. | Office | Vacant | Lower | 3,506 | 0.05 | 0.12 |
| 3988 Stanley Blvd. | Service | Vacant | Lower | 26,136 | 0.08 | 1.45 |
| 4005 First St. | Retail | Vacant | Lower | 4,878 | 0.07 | 0.24 |
| 3878 Stanley Blvd. | Service | Vacant | Lower | 13,155 | 0.08 | 0.73 |
| 3500 Valley Ave. | Indust./Service | Vacant | Lower | 127,977 | 0.08 | 7.11 |
| 3700 Boulder St. | R&D/Lt Mfng. | Vacant | Lower | 160,000 | 0.07 | 7.78 |
| 3780 Stanley Blvd. | Service | Vacant | Lower | 52,272 | 0.08 | 2.9 |
| 3675 Del Valle Parkway | Service | Vacant | Lower | 8,102 | 0.08 | 0.45 |
| NE Corner of Valley/ Stanley | Self Storage | Vacant | Lower | 112,080 | 0.01 | 0.78 |
| 3100 Valley Ave. | Warehouse | Vacant | Lower | 25,657 | 0.03 | 0.53 |
| 3 Wyoming St. | Service | Vacant | Lower | 8,233 | 0.08 | 0.46 |
| 19 Wyoming St. | Service | Vacant | Lower | 8,625 | 0.08 | 0.48 |
| 6 Wyoming St. | Service | Vacant | Lower | 20,647 | 0.08 | 1.15 |
| 3597 Utah St. | Service | Vacant | Lower | 7,449 | 0.08 | 0.41 |
| 3581 Utah St. | Service | Vacant | Lower | 8,102 | 0.08 | 0.45 |
| 3121 Bernal Ave. | Service | Vacant | Lower | 8,233 | 0.08 | 0.46 |
| 3589 Del Valle Pkwy. | Service | Vacant | Lower | 12,807 | 0.08 | 0.71 |
| SE Corner of Bernal/ Stanley | Service | Vacant | Lower | 242,539 | 0.08 | 13.47 |
| 3200 Busch Rd. | Indust./Service | Vacant | Lower | 140,742 | 0.09 | 8.80 |
| Ruby Hill - Vacant Lot | Winery Use | Vacant | Ruby Hill Lower | 30,000 | 0.07 | 1.50 |
| Ruby Hill - Vacant Lot II | Winery Use | Vacant | Ruby Hill Lower | 30,000 | 0.07 | 1.50 |
| El Charro Rd. - Staples Ranch | Light Mfng. | Vacant | Lower | 499,634 | 0.09 | 31.23 |
| El Charro Rd. - Staples Ranch | Promotional | Vacant | Lower | 280,962 | 0.07 | 13.66 |
| El Charro Rd. - Staples Ranch | Warehouse | Vacant | Lower | 243,065 | 0.03 | 5.06 |
| El Charro Rd. - Staples Ranch | Service | Vacant | Lower | 196,020 | 0.08 | 10.89 |
| Vacant AVAC Parcel | Office | Vacant | Lower | 60,000 | 0.05 | 2.08 |
| Rosa Property | Service | Vacant | Lower | 26,136 | 0.08 | 1.45 |
| Kaiser Sand & Gravel | Indust./Service | Vacant | Lower | 450,000 | 0.09 | 28.13 |
| Stoneridge Mall | Retail | Approved | Lower | 380,000 | 0.07 | 18.47 |
| Former Dillingham Bldg. - Fut. Pad | Office | Approved | Lower | 39,265 | 0.05 | 1.36 |
| Taylor Building | Office | Approved | Lower | 24,600 | 0.05 | 0.85 |
| Safe America Credit Union | Financial Institution | Approved | Lower | 25,642 | 0.1 | 1.78 |
| Shaklee | Office | Approved | Lower | 500,000 | 0.05 | 17.36 |
| Charter Properties | Office | Approved | Lower | 50,297 | 0.05 | 1.75 |
| Roche Molecular Systems (Ph 2) | R & D/Light Mnftg | Approved | Lower | 276,632 | 0.07 | 13.45 |
| General Electric - Addition | Office | Approved | Lower | 10,676 | 0.05 | 0.37 |
| Peoplesoft (Commons Bldg) | Office | Approved | Lower | 27,280 | 0.05 | 0.95 |

**Table B-3**
**Average Day Demands for Future Commercial Development**

| Project Name or Site Address | Land Use | Development Designation | Pressure Zone | Bldg. Size (Sq. Ft.) | Water Use Rate (gpd/ft$^2$) | Average Day Demand (gpm) |
|---|---|---|---|---|---|---|
| Unisource (Ph 2) | Warehouse | Approved | Lower | 135,000 | 0.03 | 2.81 |
| Peoplesoft - 1st Bldg next to BART | Office | Approved | Lower | 180,996 | 0.05 | 6.28 |
| Peoplesoft - 2nd Bldg next to BART | Office | Approved | Lower | 180,996 | 0.05 | 6.28 |
| Peoplesoft - 2nd Bldg next to BART | Office | Approved | Lower | 172,228 | 0.05 | 5.98 |
| Nearon Enterp (Ph 2 of former HP) | Office | Approved | Lower | 55,417 | 0.05 | 1.92 |
| WalMart (Phase 2) | Retail | Approved | Lower | 30,000 | 0.07 | 1.46 |
| Future Restaurant w/o Bernal Plaza | Restaurant | Approved | Lower | 8,000 | 0.61 | 3.39 |
| SFWD Property - Commercial (GC) | Retail | Approved | Lower | 18,000 | 0.07 | 0.88 |
| SFWD - Office Phase 2 (4 bldgs) | Office | Approved | Lower | 372,500 | 0.05 | 12.93 |
| SFWD - Office Phase 2 (4 bldgs) | Office | Approved | Lower | 372,500 | 0.05 | 12.93 |
| South Front Investors | Office | Approved | Lower | 17,545 | 0.05 | 0.61 |
| 350 Main St bldg (2nd story addn) | Office | Approved | Lower | 6,174 | 0.05 | 0.21 |
| Pleas. Station (New Office Bldg.) | Office | Approved | Lower | 7,700 | 0.05 | 0.27 |
| McDonalds restaurant | Restaurant | Approved | Lower | 5,134 | 0.61 | 2.17 |
| McDonalds' Future C-S Building | Service | Approved | Lower | 5,220 | 0.61 | 2.21 |
| Ruby Hill Winery (Wente) | Winery/ Barrel Storage | Approved | Ruby Hill Lower | 16,320 | 0.24 | 2.72 |
| Ruby Hill Winery (Wente) | Admin/Office | Approved | Ruby Hill Lower | 9,000 | 0.05 | 0.31 |
| Ruby Hill Winery (Wente) | Restaurant | Approved | Ruby Hill Lower | 9,000 | 0.61 | 3.81 |
| Peridot | R&D/ Light Mnftg | Approved | Lower | 20,982 | 0.07 | 1.02 |
| Chamberlain Associates | Office | Approved | Lower | 44,250 | 0.05 | 1.54 |
| Hines - Second Bldg | Office | Approved | Lower | 151,187 | 0.05 | 5.25 |
| Hines- Third Bldg | Office | Approved | Lower | 151,187 | 0.05 | 5.25 |
| Hines-Fourth Bldg | Office | Approved | Lower | 151,187 | 0.05 | 5.25 |
| CM+ Corporation | Office | Approved | Lower | 64,400 | 0.05 | 2.24 |
| Antrim | Office | Approved | Lower | 18,600 | 0.05 | 0.65 |
| RJA Office | Office | Approved | Lower | 20,593 | 0.05 | 0.72 |
| Lincoln Centre - Bldg. C | Office | Approved | Lower | 119,556 | 0.05 | 4.15 |
| Lincoln Centre - Bldg. C | Office | Approved | Lower | 119,556 | 0.05 | 4.15 |
| Lincoln Centre - Bldg. A | Office | Approved | Lower | 99,600 | 0.05 | 3.46 |
| Black Mtn Development | Office | Approved | Lower | 3,220 | 0.05 | 0.11 |
| Budget Rent-a-Car | Auto Sales& Rental | Approved | Lower | 1,504 | 0.05 | 0.05 |
| Panattoni- Bldg. 1 | Industrial | Approved | Lower | 30,000 | 0.09 | 1.88 |
| Panattoni- Bldg. 2 | Industrial | Approved | Lower | 30,000 | 0.09 | 1.88 |
| Panattoni- Bldg. 3 | Industrial | Approved | Lower | 30,000 | 0.09 | 1.88 |
| Koll Office Bldg | Office | Approved | Lower | 40,088 | 0.05 | 1.39 |
| Valley Community Church | Public & Institutional | Intensification | Lower | 7,523 | 0.162 | 0.85 |
| Downtown Core | Retail | Intensification | Lower | 50,000 | 0.07 | 2.43 |
| Downtown Core | Office | Intensification | Lower | 50,000 | 0.05 | 1.74 |
| Utility Vault Company | Industrial & Service | Intensification | Lower | 54,660 | 0.09 | 3.42 |
| ValleyCare - Skilled Nursing II | Public & Institutional | Intensification | Lower | 58,000 | 0.87 | 35.04 |
| ValleyCare - Skilled Nursing II | Public & Institutional | Intensification | Lower | 42,000 | 0.17 | 4.96 |
| ValleyCare - Skilled Nursing II | Public & Institutional | Intensification | Lower | 40,190 | 0.17 | 4.74 |
| ValleyCare - Skilled Nursing II | Public & Institutional | Intensification | Lower | 120,000 | 0.17 | 14.17 |
| Evangelical Free Church | Public & Institutional | Intensification | Lower | 70,000 | 0.16 | 7.78 |
| | | | | | **Total Demand:** | 455.3 |

Demands for senior housing were calculated separately, but using the same method as commercial demands. A water use rate of 0.87 gpd/ft$^2$ was used to estimate future demands. Table B-4 summarizes estimated water demands for future assisted living facilities. These facilities have a total project average day demand of 247 gpm, not including the 8.5% allowance for distribution system losses.

***Table B-4***
***Water Use in Future Senior Assisted-Living Housing***

| *Development* | *Location* | *Zone* | *Bldg. Size (ft$^2$)* | *No. of Beds* | *Water Use Rate (gpd/ft$^2$)* | *Average Day Demand (gpm)* |
|---|---|---|---|---|---|---|
| Kolb Property | Dublin Canyon Rd. | Dublin Canyon | 70,000 | 100 | 0.87 | 42.3 |
| GEF Corp | Pleasant Hill Rd. | Lower | 112,934 | 132 | 0.87 | 68.2 |
| Brighton Gardens | Santa Rita Rd. | Lower | 86,500 | 167 | 0.87 | 52.3 |
| Sunol Blvd. (City-Owned) | Sunol Blvd. | Lower | 70,000 | 106 | 0.87 | 42.3 |
| St. Augustine's Catholic Church | Bernal Ave. | Bonde | 70,000 | 100 | 0.87 | 42.3 |
| **Total Demand** | | | | | | **247.4** |

## B.3 Other Demand Projections

This section summarizes demand projections for parks, schools and fire stations. Similar to other demand projections, demand estimates were developed for each of these use types, and then were adjusted upward by 8.5 percent, to reflect distribution system losses, and assigned to junctions in the hydraulic model based on anticipated location. Demands presented in this section are prior to adjustment for distribution system losses.

Table B-5 summarizes estimated water use for future parks. The City projects that 307 acres of parkland will be developed. Of these, 265 acres were assumed to be developed with extensive turf area, and 42 acres with a mix of irrigated turf and open space. A unit water use of 3 acre-feet/acre/year was used for parks with extensive turf area and a unit water use of 1.5 acre-feet/acre/year was used for parks with a mix of open space and irrigated area. Over half of future park water use (279 gpm of 532 gpm total) is attributable to the planned 150-acre Bernal Community Park. Table B-5 summarizes the estimated demand for each future park.

| Table B-5<br>Water Use in Future Parks | | | | | |
|---|---|---|---|---|---|
| ***Development*** | ***Location*** | ***Pressure Zone*** | ***Irrigated Area (acres)*** | ***Water Use Rate (acre-ft/acre/yr)*** | ***Average Day Demand (gpm)*** |
| Community Park | Stoneridge Dr. | Lower | 18.8 | 3 | 35.0 |
| Community Park | Stoneridge Dr. | Lower | 35.0 | 3 | 65.1 |
| Community Park | Mohr Ave. | Lower | 40.0 | 3 | 74.4 |
| Historical Park | Foothill Rd. | 510 | 6.1 | 1.5 | 5.7 |
| Community Park | W. Lagoon Rd. | Lower | 4.9 | 1.5 | 4.6 |
| Bernal Community Park | Bernal Ave. | Lower | 150.0 | 3 | 279.0 |
| Community Park | Vineyard Ave. | Vineyard | 21.1 | 3 | 39.3 |
| Presley Devt. Passive Park | Laurel Creek Dr. | Moller 770 | 30.9 | 1.5 | 28.8 |
| **Total Demand:** | | | | | **531.9** |

Table B-6 summarizes water use for future schools. Future development plans include one new elementary school and two new high schools. CDM used a unit water use factor of 25 gpd/student, based on past master planning estimates. Future schools have a total projected average daily demand of 81 gpm.

| Table B-6<br>Water Use in Future Schools | | | | | |
|---|---|---|---|---|---|
| ***Development*** | ***Location*** | ***Pressure Zone*** | ***Number of Students*** | ***Water Use Rate (gpd/student)*** | ***Average Day Demand (gpm)*** |
| High School | Mohr Ave | Lower | 2000 | 25 | 34.7 |
| High School | Valley Ave | Lower | 2000 | 25 | 34.7 |
| Elementary School | Vineyard Ave | Vineyard | 650 | 25 | 11.3 |
| **Total Demand:** | | | | | **80.7** |

One new fire station is planned for Bernal Ave. near current new development. The estimated average day demand for this 4,000-$ft^2$ fire station at 0.23 gpd/$ft^2$ is 0.6 gpm.

# Appendix C
# Hydraulic Model Development

The hydraulic model used for this master plan is a detailed version of the City of Pleasanton's water distribution system. This section provides documentation of the development, calibration and verification of the hydraulic model. The model was developed using the $H_2O$Net software. It was subsequently converted to $H_2O$Map.

## C.1 Model Development

### C.1.1 Pipe Data, Junction Data, and Model Connectivity

The City of Pleasanton provided CDM with GIS files containing virtually all pipes, junctions, and reservoirs needed for the model. Each pipe and node carries a unique ID based on its location in the City and in the City's map books, using the following format:

Junction: WB5A1T306 → (Water facility) (Map book B5A1) (Tee Connection) (Junction #306)

Pipe : WB5A1P306413 → (Water facility)(Map book B5A1) (Pipe spans junction #306 to junction #413)

#### Pipes

Pipe diameter, age, and material were provided from the City's GIS files, though ages were missing for approximately 6 percent of the data set and material types were missing from 16 percent of the data set. The model automatically calculates pipe length based on the digitized length of the pipe. CDM estimated pipe roughness factors based on pipe age, material, and diameter, using reasonable values established by past modeling experience and from other industry sources. Most pipes with missing material type information were assumed to be ACP. In some cases, pipes with missing material type information were assumed to be similar to other adjacent pipes (e.g., PVC would be assumed in an area of other PVC pipes).

Pipes under private ownership and pipes smaller than 6-inch diameter are not included in the model.

#### Junctions

Junction elevations were provided by the City, and represent the most recent information obtained by aerial photography from an aerial survey flown in 2001.

#### Connectivity

Since GIS files are not typically set up with pipe-node connectivity in mind, CDM performed extensive checking of the City-provided data to establish correct model connectivity. $H_20$Net and similar software packages allow modelers to visualize connectivity on-screen and ensure that it matches the digitized images of pipes and

nodes. When connectivity is correct, the hydraulic model will look correct and the model will know which pipelines are hydraulically connected.

## C.1.2 Pumps

City staff provided manufacturer's pump curves for nearly all modeled pump stations and wells. Most of these pump curves were subsequently modified based on the flow rates, suction pressures, and discharge pressures reported by SCADA. Table C-1 summarizes modeled pump curves developed from manufacturer's pump curves. The table also indicates which curves were modified based on information from SCADA. Section 3 contains a complete list of pump stations and their capacities.

***Table C-1***
***Settings for Modeled Pump Curves***

| Pump or Pump Station | Curve modified to match SCADA? | Shutoff Head (ft) | Design Head (ft) | Design Flow (gpm) | Head at High Flow (ft) | High Flow (gpm) |
|---|---|---|---|---|---|---|
| Dublin Canyon PS - All | ✓ | 230 | 210 | 950 | 130 | 1,900 |
| Foothill 2 PS - Pumps 1 & 2 | ✓ | 110 | 42 | 590 | 33 | 618 |
| Foothill 2 PS - Pump 3 | ✓ | 80 | 50 | 50 | 20 | 75 |
| Foothill 2 PS - Pump 4 | ✓ | 100 | 42 | 106 | 19 | 122 |
| Grey Eagle PS - Pumps 1 & 2 | | 260 | 200 | 60 | 40 | 120 |
| Grey Eagle PS - Fire Pump | | 210 | 161 | 1,500 | 70 | 2,350 |
| Kottinger Ranch PS - All | ✓ | 350 | 250 | 300 | 165 | 405 |
| Laurel Creek PS - All | ✓ | 430 | 300 | 420 | 230 | 500 |
| Longview PS - All | ✓ | 420 | 360 | 360 | 310 | 450 |
| McCloud PS - Pumps 1 & 3 | ✓ | 215 | 165 | 1,250 | 100 | 1,850 |
| McCloud PS - Pump 2 | | 270 | 210 | 600 | 140 | 740 |
| N. Sycamore PS - All | | 400 | 310 | 950 | 160 | 1,400 |
| Ruby Hill Lower PS - All | ✓ | 150 | 104 | 840 | 40 | 1,120 |
| Ruby Hill Upper PS - All | ✓ | 450 | 345 | 575 | 190 | 790 |
| Vineyard PS - All | ✓ | 390 | 220 | 700 | 100 | 1,000 |

Note: Settings were selected to provide the most accurate shape for the pump curve. Settings for design head and flow do not necessarily correlate to the modeled operating point of each pump.

Table C-2 summarizes pump operating set points. The operation of the pump stations is based on summer-time reservoir level set points, which were provided to CDM by City operations staff. This information was supplemented by tank operations SCADA data from June and September 2001.

**Table C-2**
**Pump Station Level Control Settings for Existing Summer and Winter Operation**

| Pump Station | Pump No. | Reservoir | Summer Reservoir Level Set Points (ft) | | Winter Reservoir Level Set Points (ft) | |
|---|---|---|---|---|---|---|
| | | | Pump On | Pump Off | Pump On | Pump Off |
| McCloud | 1 | Bonde 1 | 17.5 | 21 | 9 | 14 |
| McCloud | 2 | Bonde 1 | 18 | 21.5 | 10 | 15 |
| McCloud | 3 | Bonde 1 | 18.5 | 22 | 8 | 13 |
| Vineyard | 1 | Bonde 1 | 19 | 22 | 10 | 15 |
| Vineyard | 2 | Bonde 1 | 18 | 21 | 9 | 14 |
| Longview | 1 | 770-1 | 17 | 22.5 | 17 | 22.5 |
| Longview | 2 | 770-1 | 17.5 | 22 | 17.5 | 22 |
| Longview | 3 | 770-1 | 17.5 | 21.5 | 18 | 22.5 |
| Foothill 2 | 1 | 510 | 16.5 | 19 | 10.5 | 16.5 |
| Foothill 2 | 2 | 510 | 16 | 18.5 | 10 | 16 |
| Foothill 2 | 3 | 510 | 17.5 | 20 | 10 | 17 |
| Foothill 2 | 4 | 510 | 17 | 19.5 | 9 | 15 |
| Kottinger Ranch | 1 | Kottinger Ranch | 24 | 29 | 10 | 15 |
| Kottinger Ranch | 2 | Kottinger Ranch | 22 | 30 | 9 | 14 |
| Dublin Canyon | 1 | Dublin Canyon | 17 | 21 | 10 | 15 |
| Dublin Canyon | 2 | Dublin Canyon | 16.5 | 20.5 | 9 | 14 |
| Dublin Canyon | 3 | Dublin Canyon | 16 | 20 | 8 | 13 |
| Ruby Hill Lower | 1 | Ruby Hill Lower | 19 | 23 | 10 | 15 |
| Ruby Hill Lower | 2 | Ruby Hill Lower | 18 | 22 | 10 | 15 |
| Ruby Hill Upper | 3 | Ruby Hill Upper | 19 | 22.5 | 9 | 14 |
| Ruby Hill Upper | 4 | Ruby Hill Upper | 18.5 | 22 | 9.5 | 14.5 |
| Ruby Hill Upper | 5 | Ruby Hill Upper | 18 | 21.5 | 8 | 13 |
| Laurel Creek | 1 | Laurel Creek | 17 | 22.5 | 10 | 15 |
| Laurel Creek | 2 | Laurel Creek | 16.5 | 22 | 9 | 14 |
| Laurel Creek | 3 | Laurel Creek | 16 | 21.5 | 8 | 13 |
| N. Sycamore | 1 | Lund | 18 | 20 | 10 | 15 |
| N. Sycamore | 2 | Lund | 17.5 | 19.5 | 9 | 14 |
| N. Sycamore | 3 | Lund | 17 | 19 | 8 | 13 |
| Grey Eagle | 1 | Grey Eagle | 85 psi | 108 psi | 85 psi | 108 psi |
| Grey Eagle | 2 | Grey Eagle | 82 psi | 105 psi | 82 psi | 105 psi |

## C.1.3 Reservoirs

Reservoir dimensions, bottom elevations, and overflow elevations were taken from the *City of Pleasanton Pumping and Storage Facilities Specifications Report, March 30, 1999.* All reservoirs are circular, except for Tassajara Reservoir which is hopper-shaped. Design drawings for the 8-mg Tassajara Reservoir were used to create the depth-volume relationship that is used in the model. Section 3 contains a complete list of reservoirs and their properties.

## C.1.4 Zone 7 System Model and Turnouts

For extended period simulation modeling, the hydraulic model includes Zone 7's distribution system in addition to the City's distribution system. Demand in the Zone 7 model is 61 mgd for existing conditions and 100 mgd for 2015 conditions. This demand is met from a combination of treatment plants and Zone 7 wells, including the proposed Altamont Water Treatment Plant and new wells at the Mocho and Hopyard wellfields for the 2015 model scenario. The Zone 7 model was refined with the assistance of Zone 7 staff and was included in order to assess the effects of increasing demand in the Pleasanton-DSRSD service areas, which could have the effect of decreasing pressure at Pleasanton's turnouts.

For existing conditions, Pleasanton's demand was distributed among Turnouts 1, 2, 4, 5, and 7; for 2015 conditions, all of Turnouts 1 through 7 were used. Turnouts 1 through 5 operate as flow control valves into Lower zone with a maximum capacity of 5000 gpm each. Turnouts 6 & 7 feed suction lines to the Ruby Hill and Vineyard-area pump stations.

## C.1.5 City Wells

City wells are modeled as pumps drawing on fixed-grade reservoirs, which represent the groundwater table. Pump curves were provided by the City. The levels of the fixed-grade reservoirs were determined using very limited data about ground water levels during well operation, found in the City's monthly well sounding data. The sounding data was modified as necessary to create better agreement with the well flow rates observed in the June and September 2001 SCADA data.

## C.1.6 Zone Gates and Control Valves

Zone gates and valves between zones were inserted based on information provided in the City's water facility map books (*.pdf files). The model contains 66 zone gates, one closed PRV between Ruby Hill Upper zone and Ruby Hill Lower zone, and five operational PRVs to serve Foothill-770, Lower-770, Deer Oaks, and Moller-Lower zones. PRV pressure settings for normal operation and fire flow operation were provided by City operations staff. Table C-3 summarizes PRV settings.

***Table C-3***
***Summary of PRV Settings***

| *PRV Station (Service Zone)* | *Setting (psi)* |
|---|---|
| Moller Lower | 50 |
| Lower 770 | 43 |
| Foothill 770 | 75 |
| Deer Oaks | 80 |

## C.1.7 Model Skeletonization

If all possible pipes were included, the model would contain over 9,000 pipes. This level of detail is not necessary for master planning purposes, and results in very large file sizes and slow model run times. The model was therefore skeletonized by implementing the following rules:

- In Lower zone, dead ends with diameters smaller than 8-inch diameter were deleted.
- In Lower zone, adjacent pipes of the same age, diameter, and material were combined into one pipe.
- Demands at deleted Lower zone junctions were split amongst the nearest nodes, based on proximity.
- In the upper zones, no pipes were combined or deleted.

The skeletonized model contains approximately 4,200 pipes.

## C.1.8 Demand Allocation

Demand allocation to the hydraulic model was performed using the following information provided by the City:

- Water customer billing database for calendar year 2000, listing demands by Assessor's Parcel Number (APN) and water meter type (single-family residential, multi-family, commercial, etc.)
- GIS database of City parcels, including APN.
- Zone boundaries, as established by the City's GIS layer and distribution system maps.

The process of creating the spatial distribution of water demands for the hydraulic model of the City distribution system included the following procedures:

- Excluding nodes from the demand allocation process for locations where there are no customer service connections. Such locations include nodes at high elevations near reservoirs and nodes at the suction and discharge side of pump stations.
- Matching each customer billing record with its corresponding parcel in the GIS parcel database. Some billing records correspond to multiple parcels.
- Establishing the "center" of each parcel using a GIS routine to find polygon centroids.

- Using a GIS routine to match the geographic center of each parcel with the nearest modeled node. Each parcel was matched with only one node, but each node could be matched with multiple parcels.
- Manually checking the results of the GIS parcel-node matching routine to enforce zone boundaries.
- Calculating demands by node, by summing up the billing records associated with all the parcels nearest each node.

The actual sum of demands from the billing record database was 14.1 mgd, but some billing records could not be matched with specific parcels in the GIS parcel database and were consequently neglected. This problem applied to less than 1 percent of the total billing record demands. As a result, the allocated average day demands totaled 14.0 mgd.

Billing record demands were increased by 8.5 percent to account for distribution system losses. They were then increased by another 7.2 percent to account for the increase in demands between 2000 and 2001. Applying these factors results in an average model demand of 16.3 mgd, which is just slightly larger than the actual average demand of 16.2 mgd experienced in 2001.

# C.2 Model Calibration

The purpose of model calibration was to adjust pipe roughness values (within normal ranges) in order to match the head losses observed during hydrant testing. Fifteen hydrant tests were performed by the City on September 25 and 26, 2001, with the assistance of CDM staff.

## C.2.1 Hydrant Test Procedure

At each of the fifteen hydrant test locations, one hydrant was selected as the flow hydrant, and one or two adjacent hydrants were selected to measure residual pressures. First, the static pressure was recorded at all hydrants. Then, the flow hydrant was opened, and the flowrate out of the hydrant was measured with a "Hose Monster." The "Hose Monster" is essentially a pitot pressure gage with an instrument-specific chart that relates flowrate to pitot pressure. Pitot pressures tended to fluctuate widely during testing, so the "average" pressure during the test was used to determine the flowrate. Therefore, the reported flow rate is probably a relatively rough estimate of the actual flow produced.

While the flow hydrant was open, the pressured at the residual hydrants were also recorded. Typically, the residual hydrants were several hundred feet away from the flow hydrant. The observed pressure drop at the residual hydrant over the duration of the test is related to the diameter and roughness of the pipe in the vicinity of the tested hydrants. This relationship is the basis for the adjustments in roughness values made during model calibration.

## C.2.2 Model Input

The City of Pleasanton and Zone 7 Water Agency provided CDM with distribution system SCADA data for the hydrant testing days of September 25 and 26, 2001. The SCADA data was used to set reservoir levels, pump on/off status, and turnout head/flow conditions for each hydrant test. In addition, the September 2001 Flow Report provided by the City was used to set a global demand multiplier for each day of hydrant testing; a diurnal curve was not applied.

A sensitivity test was performed for two of the hydrant test model runs to determine whether implementing a diurnal curve would significantly change the results, but this did not appear to be the case. Nonetheless, the absence of a diurnal curve is one potential source of error between the hydrant test and model results.

Each model run is static, representing instantaneous conditions at the time of the hydrant test. Although fifteen hydrant tests were performed, only fourteen model runs were completed, since one hydrant test (#3, Vine St. at the Royal Garden Apartments) was located on private water lines that are not part of the hydraulic model.

## C.2.3 Calibration Method and Results

Each calibration model scenario was run both with and without a hydrant open. The difference in pressure between the two runs was compared with the pressure drop observed during hydrant testing.

The modeled static pressures were also compared with observed static (pre-test) pressures. However, these comparisons were not used for calibration purposes because, under low flow conditions, modifying roughness values does not produce a large change in static pressure. The error in static pressure is most likely due to another source, such as small errors in elevation, or invalid SCADA data related to head at the Zone 7 turnouts.

The calibration process consisted of changing roughness values until the difference between observed and modeled pressure drops reached a minimum or acceptably low value. Roughness values in the model are represented by the Hazen-Williams roughness coefficient, or C-value, which is inversely proportional to head loss. H high C-values correspond to small roughness and head losses. Most pipelines in good condition or with interior linings have C-values ranging from 120 to 140. Pipelines with extensive corrosion, such as unlined cast-iron mains, could have C-values as low as 70 or 80. For calibration, in areas where modeled pressure drops were larger than observed pressure drops, the C-values would be increased, and vice versa.

For the most part, all roughness factor adjustments were made to groups of pipes, selected on the basis of pipe material, diameter, and age (i.e., all large-diameter DIP installed between 1969 and 1975). The exception to this rule is Ruby Hill, which was assigned a roughness factor of 130 since the area is new.

Modeled Lower zone pressure drops generally seemed to be smaller than the pressure drops observed during hydrant testing, which means system-wide head losses were too low. As a result, ACP pipes 12-inch diameter and smaller were assigned a roughness factor of 120. ACP pipes 16-inch diameter and larger kept their originally-assigned roughness factor of 130. Approximately 44 percent of the system is ACP pipe with a diameter of 12-inch diameter or smaller, while 1 percent is large-diameter ACP pipe.

Table C-4 summarizes results from the hydrant testing. The total error between observed and modeled pressure drops was measured by summing the squares of the individual errors for each hydrant test. Using this technique of error measurement allows one to disregard the +/- sign of the error, and places more emphasis on large errors than on the cumulative effect of small errors. The sum-of-squares error for the uncalibrated model was 622 $psi^2$; for the final calibrated model, sum-of-squares error was 362 $psi^2$.

As Table C-4 shows, the bulk of the error remaining after calibration comes from Test 11 (Dublin Canyon zone). This error cannot be fully explained by roughness factors, since there is only a limited range of roughness factors that are physically reasonable for each type of pipe. There may be an error in a pipe diameter, which would have a much more significant effect on head losses than roughness factors alone. A comparison of the map books with as-built drawings would be one way to determine if an error of this type exists. If one excludes the aberrant Test 11, the sum-of-squares error was reduced from 510 $psi^2$ to 139 $psi^2$ by calibration, compared with a reduction from 622 $psi^2$ to 362 $psi^2$ with Test 11 included. All of the remaining errors represent a difference of less than 5 psi between the modeled pressure drop and observed pressure drop, which is satisfactory. Additionally, in all of the tests with two residual hydrants (6 of 14), had either one of two conditions:

- One of the hydrants has an error of less than 2 psi, indicating very good agreement, OR

- One of the errors is positive, and the other is negative. In this case, modifying roughness factors improves the agreement at one hydrant, but makes it worse at the other.

In several cases, notably test #1 and most of the tests in Lower zone, removing error beyond the current level would require applying different roughness factors to the same type of pipe (e.g., ACP or PVC). Though that step might improve the agreement between the field data and model output, the imperfect quality of the field data does not justify the extra calibration effort. For example, roughness factors of below130 are generally not used for PVC, so these factors were not adjusted, even when doing so would improve calibration results.

***Table C-4***
***Summary of Hydrant Flow Test Data and Calibration Results***

| | | | | ***Flow Hydrants*** | | | | ***Residual Hydrants*** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ***Field Data*** | | ***Model*** | | ***Field Data*** | | | ***Model Results*** | | | |
| *Test #* | ***Zone*** | ***Time*** | ***Date*** | *Static Pressure (psi)* | *Pitot Flow (gpm)* | *Modeled Static Pressure (psi)* | *Observed - Model Results (psi)* | *Static Pressure (psi)* | *Residual Pressure (psi)* | *Pressure Drop (psi)* | *Modeled Static Pressure (psi)* | *Modeled Residual Pressure (psi)* | *Modeled Pressure Drop (psi)* | *Observed - Modeled Pressure Drop (psi)* |
| 1 | Bonde | 8:57 | 9/25/01 | 81 | 1699 | 80.0 | 1.0 | 79 | 62 | 17 | 77.4 | 64.6 | 12.8 | 4.2 |
| 2 | Kottinger Ranch | 8:09 | 9/26/01 | 92 | 1520 | 99.4 | -7.4 | 72 | 45 | 27 | 74.3 | 49.4 | 24.9 | 2.1 |
| 4 | Bonde | 9:23 | 9/25/01 | 97 | 1665 | 97.3 | -0.3 | 94 | 64.5 | 29.5 | 93.8 | 62.0 | 31.9 | -2.4 |
| 5 | 770 | 10:30 | 9/25/01 | 85.5 | 1127 | 88.4 | -2.9 | 112 | 102 | 10 | 113.5 | 104.8 | 8.7 | 1.3 |
| 6 | 770 | 8:38 | 9/26/01 | | 675 | 105.3 | | 112 | 81 | 31 | 114.0 | 85.8 | 28.2 | 2.8 |
| 7 | Lower | 12:07 | 9/25/01 | 68 | 1594 | 68.5 | -0.5 | 68 | 60 | 8 | 66.8 | 57.3 | 9.5 | -1.5 |
| 7 | | | | 68 | 700 | 68.5 | -0.5 | 68 | 48 | 20 | 68.5 | 53.0 | 15.5 | 4.5 |
| 8 | Lower | 12:28 | 9/25/01 | 75 | 1862 | 74.7 | 0.3 | 77 | 69 | 8 | 75.6 | 68.7 | 6.9 | 1.1 |
| 8 | | | | | | | | 78 | 68 | 10 | 75.6 | 69.6 | 6.1 | 4.0 |
| 9 | Lower | 13:57 | 9/25/01 | 56 | 1442 | 54.3 | 1.8 | 50 | 43 | 7 | 49.1 | 41.2 | 7.8 | -0.8 |
| 9 | | | | 60 | 725 | 63.8 | -3.8 | 60 | 56 | 4 | 63.8 | 61.8 | 2.0 | 2.0 |
| 10 | Moller 770 | 14:23 | 9/25/01 | 89 | 1862 | 90.1 | -1.1 | 80 | 68 | 12 | 79.7 | 68.8 | 10.9 | 1.1 |
| 10 | | | | 104 | 837 | 109.2 | -5.2 | 104 | 86 | 18 | 109.2 | 95.8 | 13.5 | 4.5 |
| 11 | Dublin Canyon | 9:11 | 9/26/01 | 62 | 1830 | 65.1 | -3.1 | 70 | 46 | 24 | 70.3 | 31.4 | 38.9 | -14.9 |
| 12 | Lower | 10:09 | 9/26/01 | 67 | 1665 | 69.3 | -2.3 | 68 | 58 | 10 | 67.5 | 56.4 | 11.1 | -1.1 |
| 13 | Lower | 10:34 | 9/26/01 | 72 | 1558 | 69.6 | 2.4 | 70 | 56 | 14 | 69.6 | 56.6 | 13.1 | 1.0 |
| 13 | | | | | | | | 66 | 46 | 20 | 68.8 | 52.1 | 16.7 | 3.3 |
| 14 | Lower | 11:07 | 9/26/01 | 71 | 794 | 69.5 | 1.5 | 72 | 68 | 4 | 70.3 | 67.4 | 3.0 | 1.0 |
| 14 | | | | 68 | 772 | 69.5 | -1.5 | 68 | 60 | 8 | 69.5 | 65.4 | 4.2 | 3.8 |
| 15 | Lower | 11:38 | 9/26/01 | 66 | 1442 | 65.1 | 0.9 | 66 | 59 | 7 | 65.1 | 55.9 | 9.2 | -2.2 |
| 15 | | | | 62 | 725 | 64.2 | -2.2 | 62 | 48 | 14 | 64.2 | 51.8 | 12.5 | 1.6 |

Sum of Squares Error: 142

Sum of Squares Error: 362
Sum of Squares Error for Uncalibrated Model: 622
Sum of Squares Error, Lower Zone Only: 80
Sum of Squares Error, Upper Zones Only: 281
Sum of Squares Error, except #11: 139

Table C-5 shows the roughness factors in use following calibration and verification.

| Table C-5<br>Pipeline Roughness Factors Formulated | | | |
|---|---|---|---|
| **C** | **Material** | **Size or Zone** | **Age** |
| 80 | DIP | < 16” | 1969-1975 |
| 85 | DIP | 16” and up | 1970-1971 |
| 95 | DIP | All | 1978-1996 |
| 120 | DIP | All | 1997- |
| 80 | CIP | | 1955-1974 |
| 105 | CIP | | 1987-1992 |
| 120 | CIP | | 1999 or unknown |
| 90 | STEEL and WSP | | 1962-1966 |
| 95 | STEEL and WSP | | 1967-1970 |
| 120 | STEEL and WSP | All | 1970- |
| 120 | ACP | < 16” | |
| 130 | ACP | 16” and up | |
| 130 | PVC | All | |
| 130 | All | Ruby Hill | |

# C.3 Model Verification

To verify the validity of the hydraulic model, it was used to simulate historic operating conditions on a day of high demand. According to the City’s production data (June 2001 Flow Report), June 21st was the maximum demand day in 2001. Therefore, SCADA data from that day was used for model verification.

## C.3.1 Sources of Input Data

Zone 7 and the City of Pleasanton provided SCADA data for the operation of all facilities on June 21, 2001. This data was used in the following ways:

- Demand was calculated on an hourly basis for each zone. Demand was calculated using a water balance approach (flow in – flow out – change in storage = demand). This demand data was then used to create a diurnal curve for each zone, and to develop max day/average day demand multipliers for each zone.

- Initial reservoir levels were set to match those reported by SCADA at midnight on June 21.

- Zone 7 turnouts flows were set to match those reported in Zone 7 SCADA data.

- Pumps were turned on and off according to the observed flow patterns from the SCADA data. Pump operation for Longview Pump Station had to be inferred from the discharge pressure because no flows were available.

Zone 7 SCADA data were used as the source of information for turnout flows into Lower zone. As previously discussed with City staff, the Zone 7 flow data differ somewhat from the City’s own production data, resulting in a June 21, 2001 demand of 28.9 mgd rather than 35.9 mgd. Zone 7 flows were used because they were

available on an hourly basis, unlike City production data. City production data is recorded daily, but does not correspond to the midnight-to-midnight demand needed for verification. This uncertainty in demand is not expected to greatly impact the accuracy of the verification process, though it may be partially responsible for the tendency of Lower zone reservoirs to fill relative to SCADA observations.

## C.3.2 Model Results

If the model is reasonably accurate, modeled pump station flows and suction and discharge pressures should match observed flows and pressures from SCADA, and modeled reservoir levels should track observed levels. To assess accuracy, the verification model was run as a 24-hour simulation and the results compared to the SCADA data. Pump station flowrates, suction and discharge pressures, and reservoir tracking were used as the basis of comparison. Graphs for each facility, showing SCADA data as it compares with verification model data, are attached to this memo.

In order to improve results, the following pump station curves were updated to better match the SCADA data: Laurel Creek, Ruby Hill Upper, Kottinger Ranch, Canyon Meadows, Foothill 2 – Unit 3, Foothill 2 – Unit 4, Vineyard, and McCloud Units 1 & 3.

In general, once the modifications to pump curves were made, hydraulic model results agreed well with the SCADA data. Table C-6 summarizes findings for each facility, using the following categories to rate results:

***Table C-6***
***Summary of Facility Findings***

| ***Rating*** | ***Description*** |
|---|---|
| Excellent | Pump flows are within five percent of SCADA data, and most suction and discharge pressures are within 2 psi. |
| | Most to all hourly reservoir levels match. Differences are less than one foot. |
| Good | Pump flows are within 10 percent of SCADA data, and most suction and discharge pressures are within 5 psi. |
| | Some reservoir variations exceed one foot. |
| Fair | Pump flows within 20 percent of SCADA data, but suction and discharge pressure are off by more than 5 psi |
| | Reservoirs show differences not attributable to pump flow mismatch. |
| Poor | Significant mismatch in flows (20 percent or more), and significant problems with suction and discharge pressures. |
| | Reservoirs do not track trend data. |

Of the 27 facilities rated, 24 received a "good" or "excellent" rating. Dublin Canyon Pump Station and Longview Pump Station both showed poor agreement with SCADA data, as discussed in Table C-6.

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