DRAFT
Environmental Impact Report
Trails at Santiago Creek Specific Plan
City of Orange, Orange County, California

State Clearinghouse No: 2017031020

Prepared for:
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Date: February 23, 2018
On March 16, 2017, the City of Orange conducted a Scoping Meeting, in accordance with THE STATE CEQA GUIDELINES, for the Trails at Santiago Creek Project, (“Project”). The Project described in the Notice of Preparation (NOP) consisted of approximately 150 residential dwellings configured within various development plan alternatives. The various land use scenarios were based on the City’s approval of a Pre-Development Agreement, (“PDA”) on October 11, 2016. This PDA represented several months of meetings and discussions with community, numerous representatives from Orange Park Acres Homeowners Association (“OPA”), Mabury Ranch Homeowners Association and The Reserve Homeowners Association. An essential component of the PDA and working agreement with the community representatives was the temporary suspension of all backfill and stockpiling operations at the Sully-Miller sand and gravel operation, effective September 15, 2015. Based on the PDA, the City obtained input at the Scoping meeting. The most significant concerns expressed by the community at the Scoping meeting pertained to traffic on Santiago Canyon Road and Cannon Road; the preservation of Santiago Creek as a greenway, open space, flooding and elimination of the current sand and gravel operation.

For the last 10 months, the City, Applicant and community representatives from OPA, Mabury Ranch HOA and The Reserve HOA have worked together in addressing these concerns, as well as other related matters. This effort has resulted in the following modifications, reductions, and/or changes to the Project.

1. The number of housing units has been reduced from 150 to 129 and those units are now located in the most western portion of the property, adjacent to the County Property. The development will consist of housing types and lot sizes compatible with the surrounding neighborhoods as depicted in Exhibit 1.

2. The Property Owner proposes to widen Santiago Canyon Road and restripe Cannon Road PRIOR TO THE OCCUPANCY of any housing units as depicted in Exhibits 2 through 4. The Cannon Road restriping shall be initiated within 60 days after the Tentative Map approval and all appeal periods have expired.

3. The Property Owner proposes to fund approximately $4,100,000.00 in landscape and other improvements for the Santiago Creek Greenway as depicted in Exhibit 5. Said Improvements are to be completed or funded PRIOR TO THE 60TH CERTIFICATE OF OCCUPANCY.

4. The Property Owner is proposing to fund $1,000,000.00 in local trail improvements to be coordinated with the OPA and the City of Orange PRIOR TO THE FIRST CERTIFICATE OF OCCUPANCY.

5. The Property Owner will finance and fund the acquisition of the RIDGELINE PROPERTY as depicted in Exhibit 6, consisting of approximately 50 acres by the City of Orange or nonprofit entity for permanent open space, thus ending years of community uncertainty and division PRIOR TO THE FIRST CERTIFICATE OF OCCUPANCY.

6. The Property Owner will provide $2,000,000.00 PRIOR TO THE FIRST CERTIFICATE OF OCCUPANCY in funding for the relocation of the Mara Brandman Arena to the Ridgeline property.
Exhibit 1

Surrounding Properties with Lots Sizes Under 10,000 sq. ft.
Exhibit 2
Traffic Improvements - Existing Conditions
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Exhibit 5
Preliminary Greenway, Open Space and Trails Plan

TRAIL TYPES
- Trails A, B, D, F: Proposed Recreation Trails (Hike/Bike/Horse)
- Trail C: Existing Recreation Trail
- Trail E: Proposed Seasonal Hike/Bike/Horse Trail (optional)
- Trail G: Proposed Hike/Bike

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CITY OF ORANGE • TRAILS AT SANTIAGO CREEK SPECIFIC PLAN
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<th>Acronym</th>
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<td>micrograms per cubic meter</td>
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<td>AB</td>
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### Acronyms and Abbreviations

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<th>Acronym</th>
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<td>total dissolved solids</td>
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<td>United States Geological Survey</td>
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<td>underground storage tank</td>
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<td>Urban Water Management Plan</td>
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<td>V/C</td>
<td>volume-to-capacity ratio</td>
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<td>WDR</td>
<td>Waste Discharge Requirements</td>
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EXECUTIVE SUMMARY

Purpose

This Draft Environmental Impact Report (Draft EIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Trails at Santiago Creek Specific Plan (State Clearinghouse No. 2017031020). 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 EIR 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 EIR 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 within the City of Orange, in north-central Orange County. The site is generally located to the east of State Route 55; to the west of State Route 261; approximately 2 miles to the north of Chapman Avenue; on the north side of Santiago Canyon Road, between Orange Park Boulevard on the east and Cannon Street on the west; and south of Mabury Avenue. The site address is 6118 East Santiago Canyon Road (see Exhibit 2-1 and Exhibit 2-2). The project site is located on the Orange, California 7.5-minute quadrangle, Township 4 South, Range 9 West, Section 23 (Latitude 33° 48'55" North; Longitude 117° 47'17" West).

Project Description

The Trails at Santiago Creek Specific Plan proposes the transformation of a rock and concrete materials recycling and backfilling operation to an environmentally enhanced, ecologically friendly open space environment embracing a well-planned and attractive single-family detached residential neighborhood.

The EIR will evaluate the development of 129 dwellings on approximately 40.2 acres of the 109-acre site. The majority of the project site (63.2%) is intended for the enhancement and preservation of the natural greenway/open space and Santiago Creek environs (40.2 acres), as well as re-establishing open grasslands in areas that has been denuded by the project site’s history of commercial operations (20.5 acres), and open space/managed vegetation (8.3 acres), totaling approximately 69 acres. Recreational trails will provide public access to the enhanced revegetated interior of the site. Refer to Section 2, Project Description for a complete description of the proposed project.
Pre-Development Agreement

Public Outreach

Since 2015, over two years before the circulation of the Trails of Santiago Creek NOP, the Applicant has conducted extensive outreach with representatives of the adjacent neighborhoods, including Orange Park Association, Mabury Ranch Homeowners Association, and The Reserve Homeowners Association, in an attempt to determine community priorities for the site.

In response to the outreach and as a good faith gesture to further constructive dialogue regarding the long-term land uses for the property, the Applicant agreed to curtail and modify the current sand and gravel operations on an interim basis, as follows:

a) Suspend backfill and stockpiling operations effective September 15, 2015;
b) After July 31, 2015 restrict rock crushing operations to a total of 15 consecutive business days within a six month period;
c) Continue dust abatement measures; and
d) Continue ongoing maintenance of the property and enhance Santiago Canyon Road frontage.
e) The property owner reserved all right to resume sand and gravel operations consistent with the City’s Zoning Code.

As part of the community outreach, City staff, as well as representatives from OPA, Maybury Ranch, the Reserve, and the Applicant’s representatives worked together to establish a framework for an appropriate land use entitlement. To formalize and ensure transparency for the entitlement process, the City and the Applicant have entered said Pre-Development Agreement. This agreement sets the general parameters and provides development alternatives that are intended to guide the processing of various requested land use approvals required for the project as a byproduct of public outreach.

Pre-Development Agreement

To formalize and ensure transparency for the entitlement process, with input from Orange Park Association, Mabury Ranch Homeowners Association, and The Reserve Homeowners Association, the City and the Applicant entered into a Pre-Development Agreement (PDA) dated October 11, 2016 in accordance with the June 2015 Memorandum (included as Appendix K of this Draft EIR). This agreement establishes general parameters and sets forth various development alternatives that are intended to guide the processing of various requested land use approvals required for the project.

The major provisions of the agreement are as follows:

- Evaluate proposed alternatives (A through F below, Exhibit 2-10a and 2-10b) for the project on approximately 109 acres with a range of 25 to 50 acres available for residential units as set forth in Exhibit B of the PDA.
- An obligation of the Applicant to submit an application for land use entitlement approvals that include a General Plan Amendment, Zoning Change, Major Site Plan Review, Design Review, CEQA compliance, Development Agreement, Park Planning and Development Committee
consideration of project trails, and commitment by the City to expeditiously process these entitlements while complying with all legal requirements.

• Continue the cessation of the currently permitted operation of the sand and gravel operation during the processing of the Project consistent with the June 12, 2015 memorandum submitted by the Applicant to the City, Maybury Ranch, OPA, and the Reserve (attached within the PDA). The Applicant will also commence the interim remediation of the property, which will result in the lowering of the existing sand and gravel material stockpiles on the project site; subject to the Applicant’s right to resume sand and gravel operations.

• Cooperation between the Applicant and the City for the evaluation of easements and the possible extension of the Santiago Creek Trail to the north side of the project site.

PDA Alternative Land Use Plans
As part of the community outreach effort, City staff and the Applicant’s representatives have also worked together to establish a framework for an appropriate land use entitlement process. To formalize and ensure transparency for the entitlement process, the City and the Applicant entered into a PDA on October 11, 2016, which sets out some general parameters and development alternatives, which were born of extensive community outreach, to guide the processing of various requested land use approvals required for the project.

The PDA set forth six land use plans, described as follows:

• Alternative A consists of residential uses occupying up to 50 acres in the southern portion of the site between Santiago Creek and E. Santiago Canyon Road. This area coincides with the former mining area and the oval-shaped raised pad.

• Alternative B consists of 42 acres of residential and 67.2 acres of open space uses; no community or recreational uses would be developed. Residential would occupy the same footprint as the proposed project, albeit with 1.8 fewer acres in the western portion of the site scenario.

• Alternative C consists of 40 acres of residential and 69 acres of open space uses; no community or recreational uses would be developed. Residential would occupy the central portion of the site; the eastern portion of the site would be dedicated for open space use. The 69 acres of passive open space would consist of privately owned, undeveloped land; no community or recreational uses would be developed.

• Alternative D consists of 40 acres of residential and 69 acres of open space uses; no community or recreational uses would be developed. Residential would occupy the central portion of the site; the eastern portion of the site would be dedicated for open space use. The 69 acres of passive open space would consist of privately owned, undeveloped land; no community or recreational uses would be developed.

• Alternative E consists of 25 acres of residential, 58 acres of open space/greenway uses, and 30 acres of organic gardens and community activity center.
• Alternative F consists of residential uses would be developed 15.4 acres north of Santiago Creek, with resource land use activities (sand, gravel, and materials recycling) occurring on 77.3 acres on both sides of the waterway. Vehicular access would be taken from two points Mabury Drive. Resource land use activities would be located on 77.3 acres on both sides of the waterway. These activities would consist of the continuation of the existing materials recycling and backfilling operation.

The PDA Alternative Land Use Plans relate to the Land Use Plan/OPA 2008 “WIN-WIN” Alternative evaluated in the EIR.

Pre-Development Agreement in Relation to the Proposed Project
On March 16, 2017, the City of Orange conducted a Scoping Meeting, in accordance with the CEQA Guidelines, for the Trails at Santiago Creek Project, (“Project”). The Project described in the Notice of Preparation (NOP) consisted of approximately 150 residential dwellings configured within various development plan alternatives. The various land use scenarios were based on the City's approval of a Pre-Development Agreement, (“PDA”) on October 11, 2016. This PDA represented several months of meetings and discussions with community, numerous representatives from Orange Park Acres Homeowners Association (“OPA”), Mabury Ranch Homeowners Association and The Reserve Homeowners Association. An essential component of the PDA and working agreement with the community representatives was the temporary suspension of all backfill and stockpiling operations at the Sully-Miller sand and gravel operation, effective September 15, 2015. Based on the PDA, the City obtained input at the Scoping meeting. The most significant concerns expressed by the community at the Scoping meeting pertained to traffic on Santiago Canyon Road and Cannon Road; the preservation of Santiago Creek as a greenway, open space, flooding and elimination of the current sand and gravel operation.

For the last 10 months, the City, Applicant and community representatives from OPA, Mabury Ranch HOA and The Reserve HOA have worked together in addressing these concerns, as well as other related matters. This effort has resulted in the following modifications, reductions, and/or changes to the Project.

1. The number of housing units has been reduced from 150 to 129 and those units are now located in the most western portion of the property, adjacent to the County Property. The development will consist of housing types and lot sizes compatible with the surrounding neighborhoods.

2. The Property Owner proposes to widen Santiago Canyon Road and restripe Cannon Road prior to the occupancy of any housing units. The Cannon Road restriping shall be initiated within 60 days after the Tentative Map approval and all appeal periods have expired.

3. The Property Owner proposes to fund approximately $4,100,000.00 in landscape and other improvements for the Santiago Creek Greenway. Said Improvements are to be completed or funded prior to the sixtieth certificate of occupancy.

4. The Property Owner is proposing to fund $1,000,000.00 in local trail improvements to be coordinated with the OPA and the City of Orange prior to the first certificate of occupancy.
5. The Property Owner will finance and fund the acquisition of the Ridgeline Property, consisting of approximately 50 acres by the City of Orange or nonprofit entity for permanent open space, thus ending years of community uncertainty and division prior to the first certificate of occupancy.

6. The Property Owner will provide $2,000,000.00 prior to the first certificate of occupancy in funding for the relocation of the Mara Brandman Arena to the Ridgeline property.

**Project Objectives**

The objectives of the proposed project are to:

OBJ-1. Locate single-family detached residential units in the most suitable areas of the project site and preserve other areas for open space and greenway.

OBJ-2. Preserve and protect Santiago Creek by abating the remnants of the resource extraction activities and establishing a greenway along the creek corridor.

OBJ-3. Promote land use compatibility with neighboring residential uses through the use of locating landscaped setbacks, and the development of a compatible housing product and lot size to the adjoining uses.

OBJ-4. Develop a network of publicly accessible trails within the project site that provide access to Santiago Creek and Santiago Oaks Regional Park.

OBJ-5. Lessen the noise, improve air quality, and reduce traffic impacts from the existing materials recycling and backfilling operations within the project site.

OBJ-6. Provide a circulation system that will minimize adverse effects on local residential neighborhoods and encourage pedestrian and bicycle circulation.

OBJ-7. Provide an infrastructure system, including sewer, water, and storm drain systems that will adequately serve full build-out of the proposed project.

OBJ-8. Improve local circulation by widening of Santiago Canyon Road and restriping Cannon Road prior to the first certificate of occupancy.

**Significant Unavoidable Adverse Impacts**

No significant unavoidable impacts have been identified in this Draft EIR. All impacts were found to be less than significant after mitigation or less than significant with no mitigation required.

**Summary of Project Alternatives**

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

**Development within the Existing Land Use Designations Alternative**

This alternative consists of allowing residential development north of the Santiago Creek and the continuation of existing sand and gravel operations in accordance with the current City of Orange
General Plan and Zoning designations.\(^1\) As such, 15.4 acres of Low-Density as Residential (confirmed by the City of Orange Community Development Department) are allowed in the north-central portion of the site, north of Santiago Creek and abutting Mabury Ranch Road. Consistent with the General Plan’s density range of 2.1 to 6.0 units per acre, there is an allowable range of 32 to 92 residential homes, and a target of 77 residential homes on this 15.4-acre residential land use parcel. The existing R-1-8 Zoning for the residential area would provide a maximum of 77 single-family dwelling units based on acre density and would yield approximately 40 to 50 single-family dwelling units (although a range of 32 to 92 dwelling units could be developed under the existing land use designations). Access to this residential parcel would be from Mabury Avenue.

A section of approximately 16.5 acres of Open Space (OS) bisects the site in an east-west trend, generally following the Santiago Creek corridor, and avails itself to creekside trails to allow for connectivity to regional trails to the west, and eventually connecting to Santiago Oaks Regional Park to the east.

The majority of the site, approximately 77.3 acres, is designated Resource Area (RA) and avails itself of ongoing rock crushing and sand and gravel operations that are current and historic to the site. No changes in land use designations would occur under this alternative. Exhibit 5-1, located within Section 5, Alternatives to the Proposed Project, of this Draft EIR depicts this alternative.

### No Project Alternative/Existing Land Use Activities Alternative

The No Project Alternative/Existing Land Use Activities Alternative consists of the continuation of the existing sand and gravel operations on approximately 77.3 acres of the project site. Approximately 40 acres between Santiago Creek and E. Santiago Canyon Road are characterized by soil piles and berms, and unpaved roads. An approximately 5-acre area near E. Santiago Canyon Road supports a materials recycling operation that includes apparatus for crushing boulders, bricks, rocks, and similar materials for recycling. Since 2015, backfilling operations have been limited to 15 consecutive business days in any 6-month period; this alternative would allow backfilling operations to resume year-round as allowed by the grading permit. The project site would remain inaccessible to the public under this alternative.

### Land Use Plan/OPA 2008 “WIN-WIN” Alternative

In 2008, The Orange Park Association Real Estate Committee and Board of Directors considered a development proposal(s), prepared/presented by the developer for several parcels of property controlled by JMI Properties. The Orange Park Association Real Estate Committee and Board of Directors additionally considered alternative options for these parcels that did not originate with JMI Properties.

Immediately below is Alternative One of two alternatives prepared by the Orange Park Association Real Estate Committee and Board of Directors. Each alternative addresses a development option for properties proposed by the Orange Park Acres Association. The alternatives are mutually exclusive (i.e. either one or the other may be selected).

\(^1\) The Development within the Existing Land Use Designations Alternative corresponds to Alternative F in the PDA.
As part of the current effort, Alternative 1 has been evaluated and compared to the project as set forth in the Preface of this document.

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of 39 one-acre minimum equestrian lots for the Ridgeline property and 22 one-acre lots for Rio Santiago; totaling 61 dwellings, a 43-acre Greenway Reserve 30-acre Active Recreational Parcel, and 15-acre Commercial Equestrian Parcel located adjacent to The Reserve residential community. Overall, the OPA 2008 “WIN-WIN” Alternative would have 68 fewer dwellings, but would have 46-acres less open space in comparison to the project as set forth in the Preface of this document, and it excludes all items listed in the preface to the Draft EIR. The Land Use Plan/OPA 2008 “WIN-WIN” Alternative, as depicted in Exhibit 5-2, was included in the Position Statement for the Rio Santiago project (see Appendix L).

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 March 3, 2017. The NOP describing the original concept for the project and issues to be addressed in the EIR was distributed to the State Clearinghouse, responsible agencies, and other interested parties for a 30-day public review period extending from March 3, 2017 through April 3, 2017. The NOP identified the potential for significant impacts on the environment related to the following topical areas:

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

Disagreement among Experts

This Draft EIR 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 Orange 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 EIR 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 EIR:

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

It is also possible that evidence will be presented during the 45-day, statutory Draft EIR 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 EIR 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 EIR, and can certify the Final EIR without needing to resolve disagreements among experts.

**Public Review of the Draft EIR**

Upon completion of the Draft EIR, the City of Orange 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 EIR 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 EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR, including the technical appendices, is available for review at the City of Orange offices and the Orange Public Library. The address for each location is provided below:

- **City of Orange**
  - Community Development Department
  - Planning Division
  - 300 E. Chapman Avenue
  - Orange, CA 92866
  - Hours: Monday–Thursday: 7:30 a.m. to 5:30 p.m.

- **Orange Public Library**
  - 407 E. Chapman Avenue
  - Orange, CA 92866
  - Hours: Monday–Wednesday: 10 a.m. to 9 p.m.
  - Thursday–Saturday: 10 a.m. to 6 p.m.
El Modena Branch Library  
300 S. Hewes Street  
Orange, CA 92869  
Hours:  
Monday–Wednesday: 2:00 p.m. to 7:00 p.m.  
Thursday–Saturday: 1:00 p.m. to 6:00 p.m.

Taft Branch Library  
740 East Taft Avenue  
Orange, CA 92865  
Hours:  
Monday–Wednesday: 2:00 p.m. to 7:00 p.m.  
Thursday–Saturday: 1:00 p.m. to 6:00 p.m.

Online at the City of Orange website at:  
http://www.cityoforange.org/292/Project-NoticesRelated-Environmental-Doc

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

Mr. Robert Garcia, Senior Planner  
City of Orange  
Community Development Department, Planning Division  
300 E. Chapman Avenue  
Orange, CA 92866  
Phone: 714.744.7231  
Fax: 714.744.7222  
Email: rgarcia@cityoforange.org

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 Planning Commission public hearing. The Orange City Council will ultimately consider the comments and responses during the public hearing for the Final EIR. All 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 below 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 EIR. Table ES-1 is included in the EIR as required by CEQA Guidelines Section 15123(b)(1).
### Table ES-1: Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
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<tbody>
<tr>
<td><strong>Section 3.1—Aesthetics, Light, and Glare</strong></td>
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<tr>
<td>Impact AES-1: The project would not have a substantial adverse effect on a scenic vista.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>Impact AES-2: The project would not substantially degrade the existing visual character or quality of the site and its surroundings.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td>Impact AES-3: The project may create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.</td>
<td><strong>MM AES-3:</strong> Prior to issuance of building permits, the project applicant shall prepare and submit lighting plans to the City of Orange for review and approval. The plans shall demonstrate that all exterior lighting fixtures comply with Orange Municipal Code Chapter 17.12.030, which requires that new light fixtures be directed, controlled, screened or shaded in such a manner as not to shine directly on surrounding premises. Additionally, lighting on any residential property must be controlled so as to prevent glare or direct illumination of any public sidewalk or thoroughfares.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Section 3.2—Agriculture and Forestry Resources</strong></td>
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<tr>
<td>Impact AFR-1: The project would not convert Important Farmland to non-agricultural use.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td>Impact AFR-2: The project would not conflict with existing agricultural zoning, agricultural use or with land subject to a Williamson Act contract.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<td>Impact AFR-3: Forest: The project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Govt. Code section 51104(g)).</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td>Impact AFR-4: The project would not result in the loss of forest land or conversion of forest land to non-forest use.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<td><strong>Impact AFR-5:</strong> Forest: The project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of agricultural land to non-agricultural use or forest land to non-forest use.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Section 3.3—Air Quality</strong></td>
<td><strong>MM AIR-1a:</strong> During construction, all equipment shall be maintained in good operating condition so as to reduce emissions. The construction contractor shall ensure that all construction equipment is properly serviced and maintained in accordance with the manufacturer’s specifications. Maintenance records shall be available at the construction site for City verification.</td>
<td>Less than significant impact.</td>
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</table>
| **Impact AIR-1:** The project may conflict with or obstruct implementation of the applicable air quality plan. | **MM AIR-1b:** The following volatile organic compound (VOC) control measures shall be implemented during architectural coating activities:  
  a) Use paints with a volatile organic compound (VOC) content of no more than 100 grams per liter for both interior and exterior coatings.  
  b) Keep lids closed on all paint containers when not in use to prevent VOC emissions and excessive odors.  
  c) Use compliant low VOC cleaning solvents to clean paint application equipment.  
  d) Keep all paint and solvent laden rags in sealed containers to prevent VOC emissions.  
**MM AIR-1c:** Prior to the issuance of grading permits for the project, the project applicant shall include a dust control plan as part of the construction contract standard specifications. The dust control plan shall include measures to meet the requirements of SCAQMD Rules 402 and 403. Such basic measures may include but are not limited to the following:  
  a) All haul trucks shall be covered prior to leaving the site to prevent dust from impacting the surrounding areas.  
  b) Moisten soil each day prior to commencing grading to depth of soil cut.  
  c) Water exposed surfaces at least three times a day under calm conditions. | Less than significant impact.          |
### Table ES-1 (cont.): Executive Summary Matrix

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<td>conditions, and as often as needed on windy days or during very dry</td>
<td>d) Treat any area that will be exposed for extended periods with a soil conditioner to stabilize soil or temporarily plant with vegetation.</td>
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<td>weather in order to maintain a surface crust and minimize the release of</td>
<td>e) Use street sweepers that comply with SCAQMD Rules 1186 and 1186.1.</td>
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<td>visible emissions from the construction site.</td>
<td>f) All contractors shall turn off all construction equipment and delivery vehicles when not in use, or limit on-site idling to no more than 5 minutes in any one hour.</td>
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<td>d) Treat any area that will be exposed for extended periods with a soil</td>
<td>g) On-site electrical hook ups to a power grid shall be provided for electric construction tools including saws, drills, and compressors, where feasible, to reduce the need for diesel powered electric generators.</td>
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<td>conditioner to stabilize soil or temporarily plant with vegetation.</td>
<td>h) Traffic speeds on all unpaved roads to be reduced to 15 miles per hour or less.</td>
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<td>e) Use street sweepers that comply with SCAQMD Rules 1186 and 1186.1.</td>
<td>i) Sweep streets at the end of the day if visible soil is carried onto adjacent public paved roads.</td>
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<td>f) All contractors shall turn off all construction equipment and delivery</td>
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<td>vehicles when not in use, or limit on-site idling to no more than 5</td>
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<td>g) On-site electrical hook ups to a power grid shall be provided for</td>
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<td>electric construction tools including saws, drills, and compressors,</td>
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<td>where feasible, to reduce the need for diesel powered electric</td>
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<td>generators.</td>
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<td>adjacent public paved roads.</td>
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**MM AIR-1d**: Prior to and during grading activities, the project applicant shall comply with South Coast Air Quality Management District Rule 403 as follows:

- The applicant shall submit a fully executed Large Operation Notification (Form 403 N) to the SCQAMD Executive Officer within 7 days of qualifying as a large operation. The form shall include the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site.
- Maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request
- Install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities
- Identify a dust control supervisor that (1) is employed by or contracted with the property owner or developer; (2) is on the site or available on-site
Table ES-1 (cont.): Executive Summary Matrix

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<td>within 30 minutes during working hours; (3) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements; (4) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and (5) will notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation.</td>
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<td>MM AIR-1e: Prior to and during grading activities, the project applicant shall implement the following dust control measures for large operations, as applicable, pursuant to South Coast Air Quality Management District Rule 403:</td>
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<td>Earth Moving (except construction cutting and filling areas, and mining operations)</td>
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<td>1a. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; or</td>
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<tr>
<td>1a-1. For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.</td>
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<td>Earth Moving—Construction Fill Areas</td>
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<td>1b. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<td>evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.</td>
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<tr>
<td>Earth Moving—Construction Cut Areas and Mining Operations</td>
<td>1c. Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.</td>
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</table>
| Disturbed Surface Areas—Completed Grading Areas | 2a/b. Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.  
2c. Apply chemical stabilizers within five working days of grading completion; OR  
2d. Take actions (3a) or (3c) specified for inactive disturbed surface areas. | |
| Inactive Disturbed Surface Areas | 3a. Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; or  
3b. Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; or  
3c. Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR  
3d. Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas. | |
| Unpaved Roads | 4a. Water all roads used for any vehicular traffic at least once per every two | |
**Table ES-1 (cont.): Executive Summary Matrix**

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<td>4b.</td>
<td>Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; or</td>
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<td>4c.</td>
<td>Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.</td>
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<tr>
<td><strong>Open Storage Piles</strong></td>
<td>5a. Apply chemical stabilizers; or 5b. Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; or 5c. Install temporary coverings; or 5d. Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.</td>
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<tr>
<td><strong>All Categories</strong></td>
<td>6a. Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in this mitigation measure may be used.</td>
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<tr>
<td><strong>MM AIR-1f:</strong> Prior to and during grading activities, the project applicant shall implement the following contingency control measures for large operations, as applicable, pursuant to South Coast Air Quality Management District Rule 403:</td>
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<tr>
<td><strong>Earth Moving</strong></td>
<td>1A. Cease all active operations; or 2A. Apply water to soil not more than 15 minutes prior to moving such soil. 0B. On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<th>Level of Significance After Mitigation</th>
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<td>to maintain a stabilized surface for a period of six months; OR</td>
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<td>1B.</td>
<td>Apply chemical stabilizers prior to wind event; or</td>
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<td>2B.</td>
<td>Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or</td>
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<tr>
<td>3B.</td>
<td>Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or</td>
<td></td>
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<td>4B.</td>
<td>Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.</td>
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</table>

**Unpaved Roads**

1C. Apply chemical stabilizers prior to wind event; or                                
2C. Apply water twice per hour during active operation; or                              
3C. Stop all vehicular traffic.                                                        

**Open Storage Piles**

1D. Apply water twice per hour; or                                                    
2D. Install temporary coverings.                                                       

**Paved Road Track Out**

1E. Cover all haul vehicles; or                                                        
2E. Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads. 

**All Categories**

1F. Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in this mitigation measure may be used. 

**MM AIR-1g:** Prior to the first grading activities, the applicant shall submit documentation to the City of Orange that demonstrates that all off-road construction equipment in excess of 50 horsepower is equipped with engines meeting the EPA Tier IV off-road engine emission standards.
### Table ES-1 (cont.): Executive Summary Matrix

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<tr>
<td><strong>Impact AIR-2</strong>: The project may violate any air quality standard or contribute substantially to an existing or projected air quality violation.</td>
<td>Implement Mitigation Measures AIR-1a through AIR-1g.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact AIR-3</strong>: The project may 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.</td>
<td><strong>Impact AIR-3</strong>: The project may 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.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact AIR-4</strong>: The project may expose sensitive receptors substantial pollutant concentrations.</td>
<td>Implement Mitigation Measures AIR-1a through AIR-1g.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact AIR-5</strong>: The project would not create objectionable odors affecting a substantial number of people.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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</table>

#### Section 3.4—Biological Resources

| Impact BIO-1: The proposed project would not have a substantial adverse effect on special status plant species. | No mitigation is necessary. | Less than significant impact. |
| **Impact BIO-2**: The proposed project may have a substantial adverse effect on special status wildlife species. | **MM BIO-2a**: Prior to the issuance of any grading permit for areas supporting least Bell’s vireo habitat (such as southern cottonwood-willow riparian forest), the project applicant shall obtain federal and state take authorizations via regulatory permits (such as a CWA Section 404 permit issued by the USACE), which will require that the U.S. Fish and Wildlife Service (USFWS) be consulted as provided for by Section 7 of the FESA (for the federally listed least Bell’s vireo). The federal regulatory permits (such as CWA Section 404 permit issued by the USACE) provide a “federal nexus” by which Section 7 consultation can occur. This statute imposes the obligation on federal agencies to ensure that their actions (such as issuing federal CWA permits for this project) are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its designated critical habitat. This obligation is enforced through the procedural requirement that agencies such as the United States Army Corps of Engineers initiate consultation with the USFWS on any actions that may affect a threatened or endangered species. During the FESA Section 7 | Less than significant impact. |
consultation anticipated for this project, the USFWS will gather all relevant information concerning the proposed project and the potential project-related impacts on the least Bell’s vireo (i.e., the project applicant will submit a species-specific Biological Assessment), prepare its opinion with respect to whether the project is likely to jeopardize the continued existence of the species (i.e., the USFWS will issue a Biological Opinion), and recommend mitigation/conservation measures where appropriate. Additionally, the need for State regulatory permits (i.e., Fish and Game Code Section 1602 Streambed Alteration Agreement issued by the CDFW) will require a Consistency Determination from the CDFW for the State-listed least Bell’s vireo under CESA.

In addition, the following best management practices (BMPs) will ensure that indirect impacts will not occur to the least Bell’s vireo within 300 feet of occupied habitat as monitored by a certified biologist:

1. Construction limits in and around least Bell’s vireo potential habitat shall be delineated with flags and fencing prior to the initiation of any grading or construction activities.
2. Prior to grading and construction a training program shall be developed and implemented to inform all workers on the project about listed species, sensitive habitats, and the importance of complying with avoidance and minimization measures.
3. All construction work shall occur during the daylight hours. The construction contractor shall limit all construction-related activities that would result in high noise levels according to the construction hours determined by the City.
4. During all excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers’ standards to reduce construction equipment noise to the maximum extent possible. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors (i.e., least Bell’s vireo territory within Santiago Creek) nearest the project site.
5. The construction contractor shall stage equipment in areas that will

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<td>mitigation/conservation measures where appropriate.</td>
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<td>1. Construction limits in and around least Bell’s vireo potential habitat shall be delineated with flags and fencing prior to the initiation of any grading or construction activities.</td>
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<td>2. Prior to grading and construction a training program shall be developed and implemented to inform all workers on the project about listed species, sensitive habitats, and the importance of complying with avoidance and minimization measures.</td>
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<td>3. All construction work shall occur during the daylight hours. The construction contractor shall limit all construction-related activities that would result in high noise levels according to the construction hours determined by the City.</td>
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<td>4. During all excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers’ standards to reduce construction equipment noise to the maximum extent possible. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors (i.e., least Bell’s vireo territory within Santiago Creek) nearest the project site.</td>
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<td>5. The construction contractor shall stage equipment in areas that will</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<td>create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the project site during all project construction.</td>
<td>6. Noise from construction activities shall be limited to the extent possible through the maximum use of technology available to reduce construction equipment noise. Project-generated noise, both during construction and after the development has been completed, shall be in compliance with the requirements outlined in the City of Orange General Plan Noise Element to ensure that noise levels to which the riparian area is exposed do not exceed noise standards for residential areas.</td>
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<td>7. The project shall be designed to minimize exterior night lighting while remaining compliant with City of Orange ordinances related to street lighting. Any necessary lighting (e.g., to light up equipment for security measures), both during construction and after the development has been completed, will be shielded or directed away from Santiago Creek and are not to exceed 0.5 foot-candles. Monitoring by a qualified lighting engineer (attained by the project applicant and subject to spot checking by City Staff) shall be conducted as needed to verify light levels are below 0.5 foot-candles required within identified, occupied least Bell’s vireo territories, both during construction and at the onset of operations. If the 0.5 foot-candles requirement is exceeded, the lighting engineer shall make operational changes or install a barrier to alleviate light levels during the breeding season.</td>
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<td>8. Two brown-headed cowbird traps shall be installed and maintained within the general vicinity of the habitat for five years.</td>
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**MM BIO-2b:** The following shall be incorporated into the Biological Assessment as proposed mitigation for potential impacts to least Bell’s vireo, subject to USFWS and CDFW approval:

1. On- or off-site restoration or enhancement of least Bell’s vireo habitat at a ratio no less than 3:1 for permanent grading impacts. Off-site restoration or enhancement may include the purchase of mitigation credits at an agency-approved off-site mitigation bank supporting least Bell’s vireo.
### Table ES-1 (cont.): Executive Summary Matrix

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<tr>
<td><strong>MM BIO-2c</strong>: All construction, grading, and fuel modification activities (i.e., thinning) shall take place outside of the least Bell’s vireo breeding season (March 15 to September 15) to the greatest extent feasible. If any construction, grading, and fuel modification activities are required during the breeding season within 300 feet of potential least Bell’s vireo habitat, and pre-construction surveys determine least Bell’s vireo are present, activities may continue in the presence of a biological monitor who will confirm that no work will occur within a 300-foot buffer of least Bell’s vireo, and that any least Bell’s vireo are not being disturbed by project activities. If any disturbance to the least Bell’s vireo is detected by the biological monitor, the buffer will be increased, other disturbance minimizing measures may be implemented (e.g., visual and/or noise barrier), and/or work will cease as recommended by the monitor. Additional measures to be taken for all construction activities within 300 feet of potential least Bell’s vireo habitat during the breeding season (March 15 to September 15):</td>
<td>1. Pre-construction surveys shall be conducted within 1 week prior to initiation of construction activities and all results forwarded to the USFWS and CDFW. Focused surveys shall be conducted for least Bell’s vireo during construction activities. 2. If at any time least Bell’s vireo are found to occur within 300 feet of construction areas, the monitoring biologist shall inform the appropriate construction supervisor to cease such work and shall consult with the USFWS and CDFW to determine if work shall commence or proceed during the breeding season and, if work may proceed, what specific measures shall be taken to ensure least Bell’s vireos are not affected. 3. Installation of any noise barriers and any other corrective actions taken to mitigate noise during the construction period shall be communicated to the USFWS and CDFW. <strong>MM BIO-2d</strong>: Prior to the issuance of any grading permit that would remove all removal of habitat containing raptor and songbird nests, the project applicant shall demonstrate to the satisfaction of the City that either of the following have been or will be accomplished.</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<tr>
<td>1. Vegetation removal activities shall be</td>
<td>1. Vegetation removal activities shall be scheduled outside the nesting season (September 1 to February 14 for songbirds; September 1 to January 14 for raptors) to avoid potential impacts to nesting birds.</td>
<td>Less than significant impact.</td>
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<td>scheduled outside the nesting season</td>
<td>2. Any construction activities that occur during the nesting season (February 15 to August 31 for songbirds; January 15 to August 31 for raptors) will require that all suitable habitat be thoroughly surveyed for the presence of nesting birds by a qualified biologist before commencement of clearing. If any active nests are detected, a buffer of at least 300 feet (500 feet for raptors) will be delineated, flagged, and avoided until the nesting cycle is complete, or as determined appropriate by the biological monitor, to minimize impacts.</td>
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<tr>
<td>2. Any construction activities that occur</td>
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<td>during the nesting season</td>
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<tr>
<td>3. Prior to the issuance of any grading</td>
<td>Impact BIO-3: The project may impact sensitive natural communities.</td>
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| permit in the areas designated as sensitive  | MM BIO-3: Prior to the issuance of any grading permit in the areas designated as sensitive riparian communities (e.g., southern cottonwood-willow riparian forest or black willow scrub/ruderal), the project applicant shall demonstrate to the satisfaction of the City that either of the following have been or will be accomplished:  

On- or off-site restoration or enhancement of sensitive riparian communities (e.g., southern cottonwood-willow riparian forest) at a ratio no less than 1:1 for permanent impacts. Temporary impacts will be restored to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 1:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., Santa Ana Watershed Association [SAWA]).

If mitigation is to occur on-site and/or off-site (i.e., not an in-lieu fee program), a mitigation and monitoring plan shall be prepared. The plan shall focus on the creation of equivalent habitats within disturbed habitat areas of the project site and/or off-site. In addition, the plan shall provide details as to the implementation of the plan, maintenance, and future monitoring. Mitigation for impacts to sensitive riparian communities shall be accomplished by on- or off-site restoration and/or enhancement (e.g., transplantation, seeding, and/or planting/staking of sensitive riparian species; salvage/dispersal of duff and seed bank; removal of large stands of giant reed within riparian areas). |

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| **Impact BIO-4:** The proposed project may impact federally protected wetlands. | **MM BIO-4:** Prior to the issuance of any grading permit for permanent impacts in the areas designated as jurisdictional features, the project applicant shall obtain a CWA Section 404 permit from the USACE, a CWA Section 401 permit from the RWQCB, and Streambed Alteration Agreement permit under Section 1602 of the California Fish and Game Code from the CDFW. The following would be incorporated into the permitting, subject to approval by the regulatory agencies:  
1. On- or off-site restoration or replacement of USACE/RWQCB jurisdictional waters of the U.S/waters of the State at a ratio no less than 2:1 for permanent impacts, and for temporary impacts, restore impact area to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 2:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., SAWA).  
2. On- or off-site restoration or enhancement of CDFW jurisdictional streambed and associated riparian habitat at a ratio no less than 2:1 for permanent impacts, and for temporary impacts, restore impact area to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 2:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., SAWA). | Less than significant impact. |
| **Impact BIO-5:** The project would not interfere with fish or wildlife movement. | No mitigation is necessary. | Less than significant impact. |
| **Impact BIO-6:** The project would not conflict with local biological ordinances or policies. | No mitigation is necessary. | Less than significant impact. |
| **Impact BIO-7:** The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan | No mitigation is necessary. | Less than significant impact. |
### Table ES-1 (cont.): Executive Summary Matrix

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<td><strong>Section 3.5—Cultural Resources</strong></td>
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<td><strong>Impact CUL-1:</strong> Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered historic resources.</td>
<td><strong>MM CUL-1:</strong> In the event that buried cultural resources are discovered during construction, operations shall stop within a 50-foot radius of the find and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archaeologist 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 Department of Parks and Recreation (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 in accordance with Public Resource Code Section 21083.1 and CEQA Guidelines Section 15126.4 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.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact CUL-2:</strong> Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered archaeological resources.</td>
<td><strong>Implement Mitigation Measure CUL-1 and:</strong> <strong>MM CUL-2:</strong> During the ground disturbing activities in the areas depicted in Exhibit 3.5 1, a qualified archaeological and paleontological monitor shall be present on-site to observe earthwork activities. In the event of a discovery of</td>
<td>Less than significant impact.</td>
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<td>an archaeological or paleontological resource, the monitor shall have</td>
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<td>Less than significant impact.</td>
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<td>the discretion to halt all ground disturbing activities within 50 feet</td>
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<td>of the find until it has been evaluated for significance. If the find</td>
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<td>is determined to have an archaeological or paleontological, the procedures in Mitigation Measure CUL-1 or Mitigation Measure CUL-3 shall be implemented. Monitoring may cease once all of the areas depicted in Exhibit 3.5 1 have been thoroughly disturbed.</td>
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<td>less than significant impact.</td>
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**Impact CUL-3:** Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered paleontological resources.

**MM CUL-3:** If the subsurface excavations for this project are proposed to exceed depths of 15 feet below surface, a qualified paleontological monitor should be retained to observe such excavations, which may breach the older Quaternary Alluvium deposits. In this situation, a detailed Mitigation Monitoring Plan (MMP) or Paleontological Resource Impact Management Plan (PRIMP) should be prepared in order to set forth the observation, collection, and reporting duties of the paleontological monitor. Additional mitigation measures and procedures will be outlined in the MMP or PRIMP as needed.

In the event that fossils or fossil-bearing deposits are discovered during construction activities that are shallower than 10 feet in depth, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The paleontologist shall document the discovery as needed (in accordance with Society of Vertebrate Paleontology standards), evaluate the potential resource, 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 Lead Agency for review and approval prior to implementation, and the Applicant shall adhere to the recommendations in the plan.
**Table ES-1 (cont.): Executive Summary Matrix**

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<tr>
<td><strong>Impact CUL-4</strong>: Subsurface construction activities associated with the proposed project may damage or destroy previously undiscovered human burial sites.</td>
<td><strong>MM CUL-4</strong>: 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 Native American Heritage Commission (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.</td>
<td>Less than significant impact.</td>
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### Table ES-1 (cont.): Executive Summary Matrix

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<td><strong>Section 3.6—Geology and Soils</strong></td>
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<td><strong>Impact GEO-1:</strong> The project may expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic hazards.</td>
<td><strong>MM GEO-1:</strong> Prior to the issuance of building permits, the project applicant shall submit a design-level Geotechnical Investigation to City of Orange for review and approval. The investigation shall be prepared by a qualified engineer and identify grading and building practices necessary to achieve compliance with the latest adopted edition of the California Building Standards Code’s geologic, soils, and seismic requirements. The measures identified in the approved report shall be incorporated into the Project plans.</td>
<td>Less than significant impact.</td>
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<td><strong>Impact GEO-2:</strong> The project will result in substantial soil erosion or the loss of topsoil.</td>
<td>Implement Mitigation Measure GEO-1 and HYD-1a.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact GEO-3:</strong> The project would not 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.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact GEO-4:</strong> The project would not 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.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<td><strong>Section 3.7—Greenhouse Gas Emissions</strong></td>
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<td><strong>Impact GHG-1:</strong> The project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact GHG-2:</strong> The project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
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<td><strong>Section 3.8—Hazards and Hazardous Materials</strong></td>
<td><strong>Impact HAZ-1:</strong> 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.</td>
<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact HAZ-2:</strong> The project may 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.</td>
<td><strong>MM HAZ-2a:</strong> The proposed occupied structures shall be situated strategically to allow for future remediation of any potential landfill gas migration. Prior to issuance of building permits for dwelling units in areas of the project site where vapor intrusion has the potential to occur, the applicant shall prepare and submit plans to the City of Orange identifying vapor intrusion abatement measures for trichloroethylene (TCE) and methane. Areas where vapor intrusion has the potential to occur are those identified in the Phase II Environmental Site Assessment. Such abatement measures may include but are not limited to vapor barriers or passive/active venting systems, as determined by the appropriate regulatory agency. The approved abatement measures shall be incorporated into project building plans. Design plans for: 1) any occupied structures within 1,000 feet of the landfill boundary; and/or 2) structural systems to prevent gas-related hazards are required to be reviewed and approved by the County of Orange Health Care Agency/Local Enforcement Agency. <strong>MM HAZ-2b:</strong> Prior to issuance of grading permits, the project applicant shall retain a qualified hazardous materials contractor to remove all soil containing Total Petroleum Hydrocarbons in excess of residential development standards set forth by the California Department of Toxic Substances Control (DTSC) or other applicable regulatory agency. Soil removal and disposal shall occur in accordance with DTSC (or other applicable agency) guidelines. The applicant shall submit documentation to the City of Orange in the form of confirmatory soil sampling results verifying that this mitigation measure was successfully implemented as part of the grading permit application for this property. All environmental investigations, sampling and/or remediation for the project site shall be conducted under a workplan approved and overseen by a regulatory agency with jurisdiction to oversee hazardous substance cleanup.</td>
<td>Less than significant impact.</td>
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<td><strong>Impact HAZ-3:</strong> The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.</td>
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<tr>
<td>MM HAZ-2c: Prior to commencement of any construction activities that would impact existing landfill or related gas monitoring equipment, the project applicant shall contact the City Engineer to consult with and obtain approval from the Orange County Integrated Waste Management Department for the relocation of any monitoring wells or probes that would be impacted by development on the project site.</td>
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<tr>
<td>MM HAZ-2c: Prior to commencement of any construction activities that would impact existing landfill or related gas monitoring equipment, the project applicant shall contact the City Engineer to consult with and obtain approval from the Orange County Integrated Waste Management Department for the relocation of any monitoring wells or probes that would be impacted by development on the project site.</td>
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<td>No mitigation is necessary.</td>
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<td>Less than significant impact.</td>
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<td><strong>Impact HAZ-4:</strong> The project may 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.</td>
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<td>Implement Mitigation Measure HAZ-2a.</td>
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<td>MM HAZ-5: Prior to issuance of the first building permit, the applicant shall prepare and submit plans to the City of Orange for review and approval demonstrating compliance with all applicable emergency access provisions of the Fire Code. The approved plan shall be incorporated into the proposed project.</td>
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<tr>
<td>MM HAZ-5: Prior to issuance of the first building permit, the applicant shall prepare and submit plans to the City of Orange for review and approval demonstrating compliance with all applicable emergency access provisions of the Fire Code. The approved plan shall be incorporated into the proposed project.</td>
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<td>Less than significant impact.</td>
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<td><strong>Impact HAZ-5:</strong> The project may impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.</td>
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<td>MM HAZ-6: Prior to issuance of the first building permit, the applicant shall retain a qualified fire safety consultant to prepare a Fuel Modification Plan for the proposed project. The plan shall identify defensible space around dwelling units in accordance with City requirements. The plan shall be submitted to the City of Orange for review and approval. The approved plan shall be incorporated into the proposed project.</td>
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<tr>
<td>MM HAZ-6: Prior to issuance of the first building permit, the applicant shall retain a qualified fire safety consultant to prepare a Fuel Modification Plan for the proposed project. The plan shall identify defensible space around dwelling units in accordance with City requirements. The plan shall be submitted to the City of Orange for review and approval. The approved plan shall be incorporated into the proposed project.</td>
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<td>Less than significant impact.</td>
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<tr>
<td><strong>Impact HAZ-6:</strong> The project may expose persons or property to wildland fire hazards.</td>
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| **Impact HYD-1:** Construction and operational activities associated with the proposed project may potentially degrade water quality in downstream water bodies. | **MM HYD-1a:** Prior to the issuance of grading permits, the project applicant shall file a Notice of Intent with and obtain a facility identification number from the State Water Resources Control Board. The project applicant shall also submit a Stormwater Pollution Prevention Plan (SWPPP) to the City of Orange that identifies specific actions and Best Management Practices (BMPs) to prevent stormwater pollution during construction activities. The City of Orange shall review and approve the SWPPP. The SWPPP shall identify a practical sequence for BMP implementation, site restoration, contingency measures, responsible parties, and agency contacts. The SWPPP shall include but not be limited to the following elements:  
  • Comply with the requirements of the State of California’s most current Construction Stormwater Permit.  
  • Temporary erosion control measures shall be implemented on all disturbed areas.  
  • Disturbed surfaces shall be treated with erosion control measures during the October 15 to April 15 rainy season.  
  • Sediment shall be retained on-site by a system of sediment basins, traps, or other BMPs.  
  • The construction contractor shall prepare Standard Operating Procedures for the handling of hazardous materials on the construction site to eliminate discharge of materials to storm drains.  
  • BMP performance and effectiveness shall be determined either by visual means where applicable (e.g., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination (such as inadvertent petroleum release) is required by the Santa Ana Regional Water Quality Control Board to determine adequacy of the measure.  
  • In the event of significant construction delays or delays in final landscape installation, native grasses or other appropriate vegetative cover shall be established on the construction site as soon as possible after disturbance, as an interim erosion control measure throughout the wet season. | Less than significant impact. |

Table ES-1 (cont.): Executive Summary Matrix
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<td><strong>MM HYD-1b:</strong> Prior to the issuance of building permits, the project applicant shall submit a Water Quality Management Plan to the City of Orange for review and approval. The plan shall be developed using the California Stormwater Quality Association’s “New Development and Redevelopment Handbook.” The Water Quality Management Plan shall identify pollution prevention measures and Best Management Practices necessary to control stormwater pollution from operational activities and facilities, and provide for appropriate maintenance over time. The Water Quality Management Plan shall include design concepts that are intended to accomplish a “first flush” objective that would remove contaminants from the first 2 inches of stormwater before it enters area waterways. The project applicant shall also prepare and submit an Operations and Maintenance Agreement to the City identifying procedures to ensure that stormwater quality control measures work properly during operations.</td>
<td></td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact HYD-2:</strong> The proposed project would not contribute to groundwater overdraft or impair groundwater recharge.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact HYD-3:</strong> The proposed project would not contribute runoff to downstream storm drainage facilities that would result in the potential for flooding.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact HYD-4:</strong> The proposed project would not place housing or structures within a 100-year flood hazard area.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact HYD-5:</strong> The project may be susceptible to inundation from dam failure.</td>
<td><strong>MM HYD-5:</strong> Prior to issuance of the first certificate of occupancy, the applicant shall retain a qualified consultant to prepare and implement an Emergency Evacuation Plan. The plan shall identify the various types of emergency that could affect the proposed project (e.g., dam failure, earthquake, flooding, etc.) and identify procedures for the safe and orderly evacuation of the project. The plan shall require that streets be identified with clear and visible signage and, if necessary, wayfinding signage be provided to identify exit points.</td>
<td>Less than significant impact.</td>
</tr>
</tbody>
</table>
### Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
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</thead>
<tbody>
<tr>
<td><strong>Section 3.10—Land Use and Planning</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact LUP-1:</strong> The project would not conflict with any of the applicable provisions of the City of Orange General Plan.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact LUP-2:</strong> The project would not conflict with the applicable provisions of the Orange Municipal Code.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact LUP-3:</strong> The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Section 3.11—Mineral Resources</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact MIN-1:</strong> The proposed project would not result the in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact MIN-2:</strong> The proposed project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other local land use plan.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Section 3.12—Noise</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Impact NOI-1:** The proposed project will result in 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. | **MM NOI-1a:** To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the proposed project:  
  - 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 locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site. | Less than significant impact.                  |
Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The construction contractor shall ensure that unnecessary idling of internal combustion engines (i.e., idling in excess of 5 minutes) is prohibited.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The construction contractor shall utilize “quiet” models of air compressors and other stationary noise sources where technology exists.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 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.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• The construction contractor shall designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (starting too early, bad muffler, etc.) and establishment reasonable measures necessary to correct the problem. The construction contractor shall visibly post a telephone number for the disturbance coordinator at the construction site.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• All on-site construction activities, including deliveries and engine warm-up, shall be restricted to the hours between 7:00 a.m. and 8:00 p.m. Monday through Saturday. Construction, except emergency work, shall not be permitted on Sunday or federal holidays.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MM NOI-1b:** To reduce potential future on-site exterior traffic noise impacts at on-site receptors adjacent to East Santiago Canyon Road, the following multi-part mitigation measure shall be implemented for the proposed project:

• Based on SoundPlan model runs, a 6-foot high noise barrier, relative to the receptor elevation, is required to comply with the City’s exterior noise standard for proposed residential uses located adjacent to Santiago Canyon Road. The calculated noise contours are shown in Exhibit 3.127. In order to meet the City’s exterior noise standard for community uses, a 4-foot high berm would be required along Santiago Canyon Road; or
• A minimum setback distance of 164 feet from the centerline of East
Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santiago Canyon Road shall be incorporated into the design feature. The</td>
<td>The first row of residential uses constructed 164 feet from the centerline will also have front yards facing East Santiago Canyon Road.</td>
<td></td>
</tr>
<tr>
<td>first row of residential uses constructed 164 feet from the centerline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>will also have front yards facing East Santiago Canyon Road.</td>
<td>MM NOI-1c: To reduce potential future on-site interior traffic noise impacts at on-site receptors adjacent to East Santiago Canyon Road, the following multi-part mitigation measure shall be implemented for the proposed project:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• All proposed residential units located within 560 feet of the centerline of East Santiago Canyon Road shall include an alternate form of ventilation, such as an air conditioning system, in order to ensure that windows can remain closed for a prolonged period of time. The building plans approved by the County shall reflect this requirement.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• All second story habitable rooms of proposed residential units located within 164 feet of the centerline of East Santiago Canyon Road shall include STC 30 rated windows in facades that would be parallel and perpendicular to East Santiago Canyon Road; or,</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Upon completion of the architectural plans, a detailed acoustical study shall be prepared by a qualified noise analyst that analyzes the interior noise levels of the proposed residential units and provides design features to reduce the interior noise levels to within the 45 dBA CNEL standard.</td>
<td></td>
</tr>
<tr>
<td>Impact NOI-2: The project would not expose persons to or generation of</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>excessive groundborne vibration or groundborne noise levels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact NOI-3: The proposed project would not result in a substantial</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>permanent increase in ambient noise levels in the project vicinity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact NOI-4: The proposed project will result in a substantial temporary</td>
<td>Implement Mitigation Measure NOI-1a.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>increase in ambient noise levels in the project vicinity.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 3.13—Population and Housing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact POP-1:</strong> The project would not induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Section 3.14—Public Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact PS-1:</strong> The proposed project may result in a need for new or expanded fire protection facilities.</td>
<td>Implement Mitigation Measures HAZ-5 and HAZ-6.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact PS-2:</strong> The proposed project would not result in a need for new or expanded police protection facilities.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact PS-3:</strong> The proposed project would not result in a need for new or expanded school facilities.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact PS-4:</strong> The project would not result in a need for new or expanded park facilities.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact PS-5:</strong> The proposed project would not result in a need for new or expanded public facilities such as libraries.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Section 3.15—Recreation</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact REC-1:</strong> The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact REC-2:</strong> The project would not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
</tbody>
</table>
### Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Section 3.16—Transportation and Traffic</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Impact TRANS-1</strong>: 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 Traffic Conditions.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact TRANS-2</strong>: The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Year 2022 Traffic Conditions.</td>
<td>MM TRANS-2: Prior to issuance of building permits, the project applicant shall provide the City of Orange with fair share fees to restripe the northbound approach of Orange Park Boulevard at Santiago Canyon Road to provide one exclusive left-turn lane and one shared left-turn/right-turn lane. The applicant’s fair share responsibility for these improvements is 14.5 percent.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact TRANS-3</strong>: The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Year 2040 Traffic Conditions.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact TRANS-4</strong>: The project would not 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.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
</tbody>
</table>
| **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-5: Prior to issuance of the first certificate of occupancy, the City of Orange shall verify that the applicant has improved the intersection of E. Santiago Canyon Road/Nicky Way—Project Driveway as follows:  
  - Construct the north leg of the intersection and provide one inbound lane and two outbound lanes (i.e., one dedicated left turn lane and one shared through/right-turn lane).  
  - A five-phase signal has been installed with protected left-turn phasing in the east-west direction and permissive phasing in the north-south direction.  
  - The Project Driveway provides one inbound lane and one outbound lane (shared left/through/right). | Less than significant impact.         |
Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• E. Santiago Canyon Road has been widened or restriped to provide one</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>eastbound left-turn lane and westbound right-turn lane to allow for</td>
<td></td>
<td></td>
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<tr>
<td>turning movements into the Project Driveway.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact TRANS-6: The project would not result in inadequate emergency</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>access.</td>
<td></td>
<td></td>
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<tr>
<td>Impact TRANS-7: The project would not conflict with adopted policies,</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>plans, or programs regarding public transit, bicycle, or pedestrian</td>
<td></td>
<td></td>
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<tr>
<td>facilities, or otherwise decrease the performance or safety of such</td>
<td></td>
<td></td>
</tr>
<tr>
<td>facilities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 3.17—Tribal Cultural Resources</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact TCR-1: The project would not cause a substantial adverse change</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>in the significance of a tribal cultural resource listed or eligible</td>
<td></td>
<td></td>
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<tr>
<td>for listing in the California Register of Historical Resources, or in</td>
<td></td>
<td></td>
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<tr>
<td>a local register of historical resources as defined in Public</td>
<td></td>
<td></td>
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<tr>
<td>Resources Code section 5020.1(k).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact TCR-2: The project would not cause a substantial adverse change</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>in the significance of a tribal cultural resource determined by the</td>
<td></td>
<td></td>
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<tr>
<td>lead agency, in its discretion and supported by substantial evidence,</td>
<td></td>
<td></td>
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<tr>
<td>to be significant pursuant to criteria set forth in subdivision (c)</td>
<td></td>
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<tr>
<td>of Public Resources Code Section 5024.1.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Section 3.18—Utilities and Service Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact USS-1: The proposed project would be served with adequate water</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td>supplies and would not require additional entitlements or the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>construction or expansion of water facilities.</td>
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</tbody>
</table>
### Table ES-1 (cont.): Executive Summary Matrix

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Mitigation Measures</th>
<th>Level of Significance After Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Impact USS-2:</strong> The proposed project would be served by a wastewater treatment plant with adequate capacity and would not require the construction of new or expanded facilities.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact USS-3:</strong> The proposed project would not create a need for new or expanded downstream storm drainage facilities.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact USS-4:</strong> The project would be served with adequate landfill capacity and will comply with federal, state, and local statutes and regulations related to solid waste.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
<tr>
<td><strong>Impact USS-5:</strong> The project would not result in the inefficient, unnecessary, or wasteful use of energy.</td>
<td>No mitigation is necessary.</td>
<td>Less than significant impact.</td>
</tr>
</tbody>
</table>
SECTION 1: INTRODUCTION

1.1 - Overview of the CEQA Process

This Draft Environmental Impact Report (Draft EIR) is prepared in accordance with the California Environmental Quality Act (CEQA) to evaluate the potential environmental impacts associated with the implementation of the Trails at Santiago Creek Specific Plan (State Clearinghouse No. 2017031020). 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 EIR 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 project consists of 129 single-family residential dwelling units on approximately 40 acres of the 109-acre site (Exhibit 2-8). The majority of the project site (approximately 63 percent) is intended for the enhancement and preservation of the natural greenway/open space and Santiago Creek environs (40.2 acres), as well as re-establishing open grasslands in areas that has been denuded by the project site’s history of commercial operations (20.5 acres), and open space/managed vegetation (8.3 acres), totaling approximately 69 acres. Recreational trails will provide public access to the enhanced revegetated interior of the site.

Section 2, Project Description provides a complete description of the project, and an expanded discussion of the entitlement process in the forward to this document.

1.1.2 - Purpose and Authority

This Draft EIR provides a project-level analysis of the environmental effects of the Trails at Santiago Creek Specific Plan. The environmental impacts of the proposed project are analyzed in the EIR to the degree of specificity appropriate, in accordance with CEQA Guidelines Section 15146. This document addresses the potentially significant adverse environmental impacts that may be associated with the planning, construction, or operation of the project. It also identifies appropriate and feasible mitigation measures and alternatives that may be adopted to significantly reduce or avoid these impacts.

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

- Table of Contents
- Introduction
- Executive Summary
- 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 Orange 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 EIR in the decision-making or permit process and consider the information in this Draft EIR along with other information that may be presented during the CEQA process.

This Draft EIR was prepared by FirstCarbon Solutions (FCS), an environmental consultant. This Draft EIR reflects the independent judgment and analysis of the City of Orange as required by CEQA. Lists of organizations and persons consulted and the report preparation personnel are provided in Section 8 of this Draft EIR.

1.2 - Scope of the EIR

This Draft EIR addresses the potential environmental effects of the proposed project. The City of Orange issued a Notice of Preparation (NOP) for the proposed project on March 3, 2017, which circulated between March 3, 2017 and April 3, 2017 for the statutory 30-day public review period. The scope of this Draft EIR 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 EIR.

Eighty-one comment letters were received in response to the NOP. They are listed in Table 1-1 and provided in Appendix A of this Draft EIR.

Table 1-1: NOP Comment Letters

<table>
<thead>
<tr>
<th>Status</th>
<th>Affiliation</th>
<th>Signatory</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Agencies</td>
<td>South Coast Air Quality Management District</td>
<td>Lijin Sun, CEQA IGR Program Supervisor</td>
<td>March 17, 2017</td>
</tr>
<tr>
<td></td>
<td>California Department of Fish and Wildlife</td>
<td>Jennifer Turner, Environmental Scientist</td>
<td>March 23, 2017</td>
</tr>
<tr>
<td></td>
<td>United States Fish and Wildlife Service</td>
<td>Karen Goebel, Assistant Field Supervisors; Jonathan Snyder</td>
<td>March 24, 2017</td>
</tr>
<tr>
<td></td>
<td>OC Waste &amp; Recycling</td>
<td>Jeff Arbour, Environmental Services Manager</td>
<td>March 29, 2017</td>
</tr>
<tr>
<td></td>
<td>Irvine Ranch Water District</td>
<td>Fiona Sanchez, Director of Water Resources</td>
<td>March 31, 2017</td>
</tr>
<tr>
<td></td>
<td>OC Public Works</td>
<td>Laree Alonso, Planning Division Manager</td>
<td>March 31, 2017</td>
</tr>
</tbody>
</table>
Table 1-1 (cont.): NOP Comment Letters

<table>
<thead>
<tr>
<th>Status</th>
<th>Affiliation</th>
<th>Signatory</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>California</td>
<td>Department of Fish and Wildlife</td>
<td>Gail Sevrens, Environmental Program Manager</td>
<td>April 3, 2017</td>
</tr>
<tr>
<td>City of Anaheim</td>
<td></td>
<td>Christine Saunders, Associate Planner</td>
<td>April 3, 2017</td>
</tr>
<tr>
<td>City of Irvine</td>
<td></td>
<td>Bill Jacobs, Principal Planner</td>
<td>April 3, 2017</td>
</tr>
<tr>
<td>Orange County</td>
<td>Water District</td>
<td>Gary Woodside, Executive Director of Planning and Natural Resources</td>
<td>April 3, 2017</td>
</tr>
<tr>
<td>Private Parties</td>
<td>Private Citizens</td>
<td>Donna Elliot and Brian Elliot</td>
<td>March 12, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizens</td>
<td>Robert Brunner and Kathleen Brunner</td>
<td>March 13, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizen</td>
<td>Joel Robinson</td>
<td>March 14, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizen</td>
<td>Allyson Ascher</td>
<td>March 16, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizen</td>
<td>Bonnie Robinson</td>
<td>March 16, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizens</td>
<td>Robert Wagner and Nancy Wagner</td>
<td>March 16, 2017</td>
</tr>
<tr>
<td></td>
<td>Santiago Creek Greenway Alliance</td>
<td>John Moore, President; Pamela Galera, Vice President</td>
<td>March 17, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizen</td>
<td>Michael Granek</td>
<td>March 17, 2017</td>
</tr>
<tr>
<td></td>
<td>Private Citizens</td>
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Table 1-1 (cont.): NOP Comment Letters

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<td>Ken Kribel</td>
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<tr>
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<td>Stephanie Lesinski, Addison Adams, Dan Martin</td>
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1.2.1 - Scoping Meeting

Pursuant to CEQA Guidelines Section 15082(c)(1), the City of Orange held a public scoping meeting for the proposed project on Thursday, March 16, 2016 at Salem Lutheran Church and School, 6500 East Santiago Canyon Road, Orange, CA 92869. The meeting was duly noticed in the NOP that was posted on the City’s website and directly mailed to public agencies and private parties. The scoping meeting sign-in sheet is provided in Appendix A. Table 1-2 provides the names of attendees to the scoping meeting.
Table 1-2 (cont.): Scoping Meeting Attendees

<table>
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<td>Toni Bradley</td>
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<td>Donna Elliot</td>
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<td>Leisha Fauth</td>
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<td>Tom Rapport</td>
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1.2.2 - Environmental Issues Determined Not To Be Significant

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:

- State Scenic Highways (Section 3.1, Aesthetics, Light, and Glare)
- Septic and Alternative Wastewater Disposal Systems (Section 3.6, Geology and Soils)
- Airports (Section 3.8, Hazards and Hazardous Materials)
- Private Airstrips (Section 3.8, Hazards and Hazardous Materials)
- Seiches, Tsunamis, or Mudflows (Section 3.9, Hydrology and Water Quality)
- Division of an Established Community (Section 3.10, Land Use and Planning)
- Aviation Noise (Section 3.12, Noise)
- Displacement of Persons or Housing (Section 3.12, Population and Housing)
- Air Traffic Patterns (Section 3.16, Transportation and Traffic)

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

1.2.3 - 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 EIR. These sections are as follows:
1.3 - Organization of the EIR

This Draft EIR 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 EIR. 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 EIR, 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 EIR, 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—Agriculture Resources and Forest Resources:** Addresses the potential for conversion of Important Farmland to non-agricultural use and forest land to non-forest use.
  - **Section 3.3—Air Quality** Addresses the potential air quality impacts associated with project implementation, as well as consistency with the South Coast Air Quality Management District’s Air Quality Management Plan. In addition, the section also evaluates project emissions of criteria pollutants and the potential for objectionable odors.
  - **Section 3.4—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 3.5—Cultural Resources:** Addresses potential impacts on historical resources, archaeological resources, paleontological resources, and burial sites.

- **Section 3.6—Geology and Soils:** 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 3.7—Greenhouse Gas Emissions:** Addresses the potential emissions of greenhouse gases.

- **Section 3.8—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 3.9—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 3.10—Land Use and Planning:** Addresses the potential land use impacts associated with division of an established community and consistency with the City of Orange General Plan and Orange Municipal Code.

- **Section 3.11—Mineral Resources:** Addresses the potential loss of mineral resources of statewide or regional importance.

- **Section 3.12—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 3.13—Population and Housing:** Addresses the potential for growth inducement.

- **Section 3.14—Public Services:** Addresses the potential impacts upon public services, including fire protection, law enforcement, schools, parks, and recreational facilities.

- **Section 3.15—Recreation:** Addresses the potential for physical deterioration of recreation facilities.

- **Section 3.16—Transportation and Traffic:** Addresses the impacts on the local and regional roadway system, public transportation, bicycle, and pedestrian access.

- **Section 3.17—Tribal Cultural Resources:** Addresses potential impacts on tribal cultural resources.

- **Section 3.18—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: Development within the Existing Land Use Designations Alternative, No Project Alternative/Existing Land Use Activities Alternative, and the Land Use Plan/OPA 2008 “WIN-WIN” 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
EIR. This section also contains a full list of the authors who assisted in the preparation of the
Draft EIR, by name and affiliation.

- **Section 9: References.** This section contains a full list of references that were used in the
preparation of this Draft EIR.

- **Appendices.** This section includes all notices and other procedural documents pertinent to
the Draft EIR, 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 EIR 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 EIR has also been described. The documents and other sources that have been used in
the preparation of this Draft EIR include but are not limited to:

- City of Orange General Plan
- City of Orange Municipal Code
- City of Orange 2015 Urban Water Management Plan
- City of Orange Recreational Trails Master Plan
- City of Orange Sewer Master Plan

These documents are specifically identified in Section 9, References, of this Draft EIR. In accordance
with CEQA Guidelines Section 15150(b), the General Plan, the Municipal Code, the Urban Water
Management Plan, and the referenced documents and other sources used in the preparation of the
Draft EIR are available for review at the City of Orange Community Development Department at the
address shown in Section 1.6.

### 1.5 - Documents Prepared for the Project

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

- Air Quality and Greenhouse Gas Emissions Analysis, prepared by FCS (modeling output is
  provided in Appendix B).
- Biological Resources Assessment, prepared by PCR Services (Appendix C)
- Jurisdictional Delineation, prepared by PCR Services (Appendix C)
1.6 - Review of the Draft EIR

Upon completion of the Draft EIR, the City of Orange 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 EIR 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 EIR in accordance with Public Resources Code 21092(b)(3). During the public review period, the Draft EIR, including the technical appendices, is available for review at the City of Orange Community Development Department, the Orange Public Library, El Modena Branch Library, and Taft Branch Library; as well as online. The address for each location is provided below.

City of Orange
Community Development Department
Planning Division
300 E. Chapman Avenue
Orange, CA 92866
Hours: Monday–Thursday: 7:30 a.m. to 5:30 p.m.

Orange Public Library
407 E. Chapman Avenue
Orange, CA 92866
Hours: Monday–Wednesday: 10 a.m. to 9 p.m.
Thursday–Saturday: 10 a.m. to 6 p.m.

El Modena Branch Library
300 S. Hewes Street
Orange, CA 92869
Hours: Monday–Wednesday: 2:00 p.m. to 7:00 p.m.
Thursday–Saturday: 1:00 p.m. to 6:00 p.m.

Taft Branch Library
740 East Taft Avenue
Orange, CA 92865
Hours: Monday–Wednesday: 2:00 p.m. to 7:00 p.m.
Thursday–Saturday: 1:00 p.m. to 6:00 p.m.
Online at the City of Orange website at:
http://www.cityoforange.org/292/Project-NoticesRelated-Environmental-Doc

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

Mr. Robert Garcia, Senior Planner
City of Orange
Community Development Department, Planning Division
300 E. Chapman Avenue
Orange, CA 92866
Phone: 714.744.7231
Fax: 714.744.7222
Email: rgarcia@cityoforange.org

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 Planning Commission public hearing. The Orange City Council will ultimately consider the comments and responses during its public hearing for the Final EIR. All 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

This Environmental Impact Report (EIR) analyzes the potential environmental effects of the proposed Trails at Santiago Creek Specific Plan in Orange, California.

2.1 - Project Location and Setting

2.1.1 - Location

The project is located within the City of Orange, in north-central Orange County. The site is generally located to the east of State Route 55 (SR-55); to the west of SR-261; approximately 2 miles to the north of Chapman Avenue; on the north side of Santiago Canyon Road, between Orange Park Boulevard on the east and Cannon Street on the west; and south of Mabury Avenue. The site address is 6118 East Santiago Canyon Road (see Exhibit 2-1 and Exhibit 2-2). The project site is located on the Orange, California 7.5-minute quadrangle, Township 4 South, Range 9 West, Section 23 (Latitude 33° 48’ 55” North; Longitude 117° 47’ 17” West).

2.1.2 - Existing Land Use Activities

The approximately 109.2-acre project site contains disturbed/undisturbed, privately owned undeveloped land that supported mining activities and currently supports a historically grandfathered land use sand and gravel operation in accordance with the existing Sand and Gravel zoning (Orange Municipal Code Chapter 17.32). The project site comprises 12 parcels (Exhibit 2-4) and is bisected by Santiago Creek in an east-west direction. The site contains gently sloping terrain, with an overall change in elevation from 456 feet above mean sea level in the northeast corner to 344 feet above mean sea level in the southwest corner. An approximately 10-acre, semi-oval-shaped raised pad is located in the eastern portion of the site. The pad sits roughly 15 feet higher than the mining area to the west.

Aerial photographs of the project site and area show that approximately 40 acres between Santiago Creek and E. Santiago Canyon Road contains remnants of the mining operation and is the location of the ongoing sand and gravel operation. This area is characterized by soil piles and berms, unpaved roads. An approximately 5-acre area near E. Santiago Canyon Road supports a materials recycling operation that includes apparatus for crushing boulders, bricks, rocks, and similar materials for recycling. Materials used for these operations originated primarily from off-site sources and the materials generated by these operations have historically been used both on-site and transported off-site. Ancillary uses included administration and maintenance buildings, caretaker residence, material testing laboratory, driver’s shack, rock crushing facilities, several above ground and below ground fuel storage tanks and two hot-mix asphalt plants.

Additionally, the previously mined portions of the site were “backfilled,” in which unsuitable materials were excavated and replaced with fill, pursuant to a grading permit 1 issued by the City of Orange in 2011. It was anticipated that approximately 223,000 cubic yards of material would be

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1 Grading Permit No. 2047
imported to the site during the process, including concrete, asphalt and rock that would be crushed on-site. Approximately 2,000 cubic yards of material was anticipated to be excavated from the site for reuse and would be blended with the crushed import material for a total of 225,000 cubic yards of backfill. In 2015, in “good faith” gesture, the property owner voluntarily temporarily suspended operations on the site, and limited rock crushing operations to a total of 15 consecutive business days in any 6-month period. Should entitlement of the project not succeed, the property owner reserved the right to resume all operations consistent with the Sand and Gravel zoning and grandfathered uses.

Santiago Creek enters part of the site at the eastern boundary, flows west, and exits the western boundary at N. Cannon Street. The creek originates at Irvine Lake and is tributary to the Santa Ana River. The drainage feature splits near the central portion of the project site, with an upland area separating Santiago Creek into two rivulets. The Santiago Creek waterway totals 5,355 feet in length and has an average width of approximately 55 feet, which includes the area between the ordinary high water mark and the adjacent defined wetland areas. Wetland areas are generally located on either side of the active channel. The creek corridor is privately owned and is not accessible to the public.

Natural vegetation within the site is primarily located along Santiago Creek; most of the site (81.6 acres) is classified as disturbed or mined. Plant communities include southern cottonwood-willow riparian forest, ornamental, coastal sage scrub, non-native grassland, eucalyptus woodland, coast live woodland, and undifferentiated open woodland. There are 323 trees located within the project site, of which the most common species are lemon bottlebrush, eucalyptus, coast live oak, and willow.

The Handy Creek storm drain operated by the Orange County Flood Control District (OCFCDD) (Facility No. E08506) is located in the central portion of the project site. The storm drain enters the project site from the south at the intersection of N. Nicky Way/E. Santiago Canyon Road. The storm drain conveys stormwater collected in areas south of E. Santiago Canyon Road into Santiago Creek. An unnamed storm drain located in the northwestern portion of the project site conveys stormwater collected in the Mabury Ranch neighborhood directly into Santiago Creek.

The Allen McCulloch Pipeline trunk water distribution line\(^2\) operated by the Metropolitan Water District (MWD) traverses the easterly portion of the project site and is located entirely below grade. The pipeline traverses the site within a 50-foot-wide easement. The easement crosses through the site in a northwest-southeast direction, entering the site from the north at the intersection of Mabury Avenue/Yellowstone Boulevard and exiting at the single-family residential subdivision to the south. The pipe measures 109 inches in diameter and is part of the MWD transmission system that supplies potable water to southern Orange County.

There are historic groundwater and methane monitoring wells associated with the closed adjoining Villa Park Landfill that are located on the western portion of the project site.

Site photographs of the project site are provided in Exhibit 2-3.

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\(^2\) Also referred to as the “Diemer Transmission”

Exhibit 2-1
Regional Location Map
Exhibit 2-2
Local Vicinity Map
Aerial Base
View of project site looking south from Mabury Avenue

View of project site looking southeast from Santiago Creek Trail

View of surface mining area from E. Santiago Canyon Road.

View of eastern portion of site from E. Santiago Canyon Road.

Source: FirstCarbon Solutions, 2016.
Exhibit 2-4
Assessor Parcel Map

Source: bing Aerial Imagery, Orange County Parcel Data.
2.1.3 - Surrounding Land Uses

West

The closed Villa Park Landfill and N. Cannon Street form the western boundary of the project site. The 18-acre County Villa Park Landfill property occupies the northeast quadrant of the intersection of E. Santiago Canyon Road/N. Cannon Street and is owned by the County of Orange. The landfill operated from 1962 through 1966. The site is enclosed with a fence and contains groundwater monitoring wells and a landfill gas disposal system. Areas to the west also include detached, single-family dwelling units related to Creekside Ranch (typical lot size 9,200–12,000 square feet), The Colony-North (typical lot size 8,600–12,000 square feet), and west of Cannon Street (typical lot size 7,800–10,000 square feet). See Exhibit 2-5 for location of surrounding residential uses with typical lot sizes less than 10,000 square feet. Furthermore, a memorandum prepared by the County dated May 9, 2017 outlines a proposal to develop a temporary shelter initiative to offer shelter, cot, and sanctuary facilities in a safe location to any homeless person who chooses accommodations from the outdoors. During preparation of this Draft EIR, the proposal is still under consideration.

N. Cannon Street is a four-lane divided roadway and crosses Santiago Creek via a concrete bridge. A paved Class I bicycle/pedestrian path (Santiago Creek Bike Trail) is located along the west side of N. Cannon Street south of Santiago Creek.

North

Single-family residential uses are located to the north of the project site, including Maybury Ranch (typical lot size 7,600–11,000 square feet), Hidden Creek (typical lot size 20,000–24,500 square feet), Serrano Heights (typical lot size 4,500–9,000 square feet), and Parkridge (typical lot size 8,000–12,000 square feet). Detached, single-family dwelling units are located along the north bank of Santiago Creek. See Exhibit 2-5 for location of residential uses and typical lot size. Mabury Avenue is a two-lane undivided roadway. An unpaved trail (Santiago Creek Trail) is located along the north bank of the creek, parallel to Mabury Avenue.

East

Santiago Oaks Regional Park and detached, single-family residential uses associated with The Reserve (typical lot size 20,000–44,000 square feet) form the eastern boundary of the project site. The regional park contains the Santiago Creek corridor, which consists of the waterway and dense vegetation. Detached, single-family dwelling units are located east of the project site. See Exhibit 2-5 for location of residential uses and typical lot size.

South

E. Santiago Canyon Road, a four-lane, divided roadway, forms the southern boundary of the project site. Detached single-family dwelling units associated with the Jamestown neighborhood (typical lot size 8,000–11,000 square feet), Orange Park Acres (typical lot size 50,000 to 1 acre plus square feet), Eichler Homes (typical lot size 7,600–12,000 square feet), and The Colony-South (typical lot size 7,000–10,000 square feet) are located south of the roadway. See Exhibit 2-5 for location of residential uses and typical lot size. The Mara Brandman Arena is located at the intersection of E. Santiago Canyon Road and N. Nicky Way.
2.1.4 - Land Use Designations

The City of Orange General Plan designates a portion of the project site as “Low Density Residential (LDR)” (15.4 acres), “Resource Area (RA)” (77.3 acres), and “Open Space (OS)” (16.5 acres) (Exhibit 2-6).

The City of Orange Zoning for the project site is “S-G (Sand and Gravel Extraction)” and “R-1-8 (Single-Family Residential 8,000 square-feet)” (Exhibit 2-7).

Additionally, portions of the project site are within the boundaries of the East Orange General Plan and Orange Park Acres Plan (Exhibits 3.10-1 and 3.10-2). The East Orange General Plan was adopted in 1975 and encompasses approximately 1,900 acres. Approximately 37 acres of the project site are located within the boundaries of the 1975 East Orange General Plan and are designated “Regional Park.” The Orange Park Acres Plan was adopted on December 26, 1973 and encompasses approximately 1,794 total acres. The Orange Park Acres Plan designates approximately 39 acres of the project site as “Santiago Greenbelt Plan.” The East Orange General Plan and Orange Acres Plan are specific plans.

The proposed project entitlements would include a General Plan Amendment that would remove the newly approved residential area portions of the project site from both the East Orange General Plan and Orange Park Acres Plan and instead adopt a new specific plan governing development of the project site.

Refer to Section 3.10, Land Use for a detailed discussion of project consistency with the City of Orange General Plan, City of Orange zoning, East Orange General Plan, and Orange Park Acres Plan. Additionally, land use designations for surrounding properties are included below.

West

The closed Villa Park Landfill and N. Cannon Street form the western boundary of the project site.

The 18-acre Villa Park Landfill occupies the northeast quadrant of the intersection of E. Santiago Canyon Road/N. Cannon Street and is owned by the County of Orange. The landfill operated from 1962 through 1966. The site is enclosed with a fence and contains groundwater monitoring wells and a landfill gas disposal system.

N. Cannon Street is a four-lane divided roadway and crosses Santiago Creek via a concrete bridge. A paved Class I bicycle/pedestrian path (Santiago Creek Bike Trail) is located along the west side of N. Cannon Street south of Santiago Creek.

North

Single-family residential uses (typical lot size 8,000–11,000 square feet) and Mabury Avenue form the northern boundary of the project site. Detached, single-family dwelling units are located along the north bank of Santiago Creek. Mabury Avenue is a two-lane undivided local street. An unpaved trail (Santiago Creek Trail) is located along the north bank of the creek, parallel to Mabury Avenue.
Exhibit 2-5
Surrounding Properties with Lots Sizes Under 10,000 sq. ft.
Exhibit 2-6
City of Orange General Plan Land Use

LAND USE SUMMARY*

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Acres</th>
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<td>LDR - Residential Low Density</td>
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<tr>
<td>RA - Resource Area</td>
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<td>OS - Open Space</td>
<td>16.5</td>
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<tr>
<td>TOTAL</td>
<td>116.8</td>
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</table>

* LDR acres per the City of Orange. All other acres to be considered approximate.
East

Santiago Oaks Regional Park and single-family residential uses (typical lot size 20,000–44,000 square feet) form the eastern boundary of the project site. The Santiago Creek corridor contains dense vegetation. Detached, single-family dwelling units are located east of the project site.

South

E. Santiago Canyon Road, a four-lane, divided roadway, forms the southern boundary of the project site. Detached single-family dwelling units associated with the Jamestown neighborhood (typical lot size 8,000–11,000 square feet), Orange Park Acres (typical lot size 50,000 to 1 acre plus square feet), the Fairhills Eichler Homes (typical lot size 7,600–12,000 square feet), and The Colony-South (typical lot size 7,000–10,000 square feet) are located south of the roadway. The Mara Brandman Arena is located at the intersection of E. Santiago Canyon Road and N. Nicky Way.

2.2 - Project History

2.2.1 - Proposed Project

The project site has had several owners over the years, including Sully Miller, Fieldstone, Rio Santiago and Hanson Properties; proposed projects that have been reflective of land use activities or development proposals. The following is a summary of past land use activities and development proposals.

Sully Miller

The project site has been used for resource extraction activities for close to 100 years. Mining activities occurred on-site from 1919 until 1995 and consisted of surface mining of sand and aggregates.

Agricultural production intermittently occurred on the project site with the most recent production occurring from approximately 1993 through 2004. Agricultural production included fruit orchards and strawberry production. All agricultural uses on the site ceased in 2004.

The project site has also been used intermittently for storage of firewood and green waste recycling.

Existing permitted uses consistent with the City of Orange General Plan and Figure LU-5, General Plan Land Use Policy Map pertaining to the Sully Miller property are outlined below.

City of Orange General Plan

The City of Orange General Plan Land Use Element, Figure LU-5, General Plan Land Use Policy Map, indicates three land use designations on the Sully Miller property: OS, RA, and LDR.

According to the City’s General Plan, page LU-15, OS (O S is described as “Steep hillsides, creeks, or environmentally sensitive areas that should not be developed. Although designated as permanent open space, most areas will not be developed as public parks with the exception of river and creek side areas that promote connectivity to the City’s trail system. Lands in this category include both privately held open space and public lands.”
The General Plan's RA designation is described on page LU-23 as allowing for “Agricultural uses and continued use of stream and river channels for aggregate mining. Passive and active recreational uses are also permitted. May serve as a holding zone for future uses compatible with established and planned land uses in surrounding areas.”

According to page LU-13 of the General Plan, LDR 2.1-6.0 du/ac. Designation is described as “Conventional single-family residential development characterized by individual single-family homes constructed in subdivisions, or by custom units built on individual lots.”

The approximate acres by land use designation for the Sully Miller property consistent with the City’s General Plan Land Use Policy Map designation for the property results in the following:

**Sully Miller Site (109.2 acres)**
- OS—16.2 acres
- RA—76.7 acres
- LDR—15.4 acres

**City of Orange Zoning**
The City of Orange Zoning Map indicates two land use designations on the Sully Miller property: Sand and Gravel (SG) and Residential—8,000sf min. lot (R-1-8).

According to the City of Orange Municipal Code, Title 17, Zoning, Chapter 17.14, Residential Districts, and Section 17.14.020, Districts Established, the zoning designation R-1-8 is described as “A single-family residential district with a minimum lot area of 8,000 square feet.”

Chapter 17.32, Sand and Gravel Extraction District Section 17.32.01, Purpose and Intent states that “… It is also the intent of these regulations to provide assurance that as soon as it is feasible to do so that excavated areas will be maintained or modified in order to guarantee that the property will be suitable for a useful purpose.” Section 17.32.030, Prohibited Uses, states “Any use not listed in Table 17.32.020 as a permitted use, conditional use, or accessory use is prohibited. However, the Community Development Director shall have the authority to determine whether an unlisted use substantially conforms to the intent of this chapter.”

The approximate acres by zoning designation for the Sully Miller property consistent with the City’s Zoning Map results in the following:

**Sully Miller Site (109.2 acres)**
- SG—97.4 acres
- R-1-8—11.8 acres

**Previous Development Proposals**

**Fieldstone**
The project site was the subject of a proposed residential development known as the Sully Miller/Fieldstone Communities project (the Fieldstone Project). In October 2003, the City Council approved the Fieldstone Project, certifying an Environmental Impact Report (Final EIR No. 1647-00)
The City of Orange approved a series of land use entitlement permits, including a General Plan Amendment, Orange Park Acres Plan Amendment (processed as a General Plan Amendment), 1975 East Orange (EO) General Plan Amendment (GPA), Zone Change, and Tentative Tract Map. The City Council took no specific action with respect to the Specific Plan Amendments, Zone Change, or the certified Fieldstone Project EIR. City staff have determined that the City Council’s action related to the referendum invalidated the Specific Plan Amendments and Zone Change. The Final Map was not recorded.

The Fieldstone Project (Fieldstone Communities) proposed the development of a gated residential community with a maximum of 189 single-family homes on lots ranging from 8,000 to 22,000 square feet. The residential development was spread across most of the project site, including both the north and south sides of Santiago Creek encompassing approximately 83 acres. The remaining portion of the site consisted of approximately 26 acres of open space (approximately 31 percent of the site), which did not include a greenway aspect, unlike the proposed Trails of Santiago project. The project proposed private internal streets, open space and recreation areas, and riding and hiking trail linkages along Santiago Creek and E. Santiago Canyon Road. Access to the project was proposed off E. Santiago Canyon Road and Mabury Avenue.

**Rio Santiago**

In 2013, the Rio Santiago project (JMI/Santiago Partners, LLC) proposed a variety of residential housing totaling 395 dwelling units. The remainder of the project site consisted of approximately 10 acres of active recreation and playfields, and approximately 50 acres (approximately 45 percent of the site) of natural greenway/open space. In the southeastern portion of the site, abutting the closed Villa Park Landfill, the 10-acre recreation parcel was proposed that included a YMCA-type facility with outdoor swimming pools, an Autism Center, sports courts and playfields, and passive play areas. A multipurpose trail easement was provided along the north side of E. Santiago Canyon Road to connect to the City’s existing trail to the east, and another trail easement extended into the site from E. Santiago Canyon Road to the Greenway Reserve, paralleling the community entry and then extending along the Handy Creek easement. The application required approval of a General Plan Amendment, Zone Change, Tentative Tract Map, Tentative Parcel Map, Major Site Plan Review, Design Review, and a Development Agreement. The City of Orange issued a Draft EIR in May 2013. The Orange City Council rejected the proposed Rio Santiago land use plan in June 2014.

**Hanson Properties**

In 1993, the City of Orange approved the Hanson Properties Development for residential on 12.6 acres of the Sully Miller aggregate mining property to the north bank of Santiago Creek, east of Lassen Boulevard, and south of Mabury Avenue. The Hanson Properties Development required the following discretionary approvals: General Plan Amendment from Resource Area to Low Density Residential, Zone Change from S-G to R-1-8. While the property was not developed, the discretionary approvals remained in place, and the area remains as LDR in the General Plan and is zoned for R-1-8.
2.3 - Project Characteristics

2.3.1 - Pre-Development Agreement

Public Outreach

Since 2015, over two years before the circulation of the Trails of Santiago Creek NOP, the Applicant has conducted extensive outreach with representatives of the adjacent neighborhoods, including Orange Park Association, Mabury Ranch Homeowners Association, and The Reserve Homeowners Association, in an attempt to determine community priorities for the site.

In response to the outreach and as a good faith gesture to encourage further constructive dialogue regarding the long-term land uses for the property, the Applicant agreed to curtail and modify the current sand and gravel operations on an interim basis, as follows:

a) Suspend backfill and stockpiling operations effective September 15, 2015;

b) After July 31, 2015, restrict rock crushing operations to a total of 15 consecutive business days within a six month period;

c) Continue dust abatement measures; and

d) Continue ongoing maintenance of the property and enhance Santiago Canyon Road frontage.

e) The property owner reserved all right to resume sand and gravel operations consistent with the City’s Zoning Code.

As part of the community outreach, City staff, as well as representatives from OPA, Maybury Ranch, the Reserve, and the Applicant’s representatives worked together to establish a framework for an appropriate land use entitlement. To formalize and ensure transparency for the entitlement process, the City and the Applicant have entered into a Pre-Development Agreement. This agreement sets the general parameters and provides development alternatives that are intended to guide the processing of various requested land use approvals required for the project as a byproduct of public outreach.

Pre-Development Agreement

To formalize and ensure transparency for the entitlement process, with input from Orange Park Association, Mabury Ranch Homeowners Association, and The Reserve Homeowners Association, the City and the Applicant entered into a Pre-Development Agreement (PDA) dated October 11, 2016 in accordance with the June 2015 Memorandum (included within Appendix K of this Draft EIR). This agreement establishes general parameters and sets forth various development alternatives that are intended to guide the processing of various requested land use approvals required for the project (see Appendix K for PDA).

The major provisions of the agreement are as follows:

- Evaluate proposed alternatives A through F for the project on approximately 109 acres with a range of 25 to 50 acres available for residential units as set forth in Exhibit B of the PDA. See Exhibits 2-10a and 2-10b on pages 2-33 and 2-35.
An obligation of the Applicant to submit an application for land use entitlement approvals that may include a General Plan Amendment, amendments to the Orange Park Acres and East Orange Plan to remove the project area from the coverage of both documents, Zoning Change, adoption of a stand-alone Specific Plan that will regulate development on-site, Major Site Plan Review, Design Review, CEQA compliance, Development Agreement, Park Planning and Development Committee consideration of project trails, and commitment by the City to expeditiously process these entitlements while complying with all legal requirements.

Continue the cessation of the currently permitted operation of the sand and gravel operation during the processing of the Project consistent with the June 12, 2015 memorandum submitted by the Applicant to the City (attached within the PDA). The Applicant will also commence the interim remediation of the property, which will result in the lowering of the existing sand and gravel material stockpiles on the project site; subject to the Applicant’s right to resume sand and gravel operations.

Cooperation between the Applicant and the City for the evaluation of easements and the possible extension of the Santiago Creek Trail to the north side of the project site.

Pre-Development Agreement in Relation to the Proposed Project

On March 16, 2017, the City of Orange conducted a Scoping Meeting, in accordance with the CEQA Guidelines, for the Trails at Santiago Creek Project ("Project"). The Project described in the Notice of Preparation (NOP) consisted of approximately 150 residential dwellings configured within various development plan alternatives. The various land use scenarios were based on the City's approval of a Pre-Development Agreement ("PDA") on October 11, 2016. This PDA represented several months of meetings and discussions with community, numerous representatives from Orange Park Acres Homeowners Association ("OPA"), Mabury Ranch Homeowners Association and The Reserve Homeowners Association. An essential component of the PDA and working agreement with the community representatives was the temporary suspension of all backfill and stockpiling operations at the Sully-Miller sand and gravel operation, effective September 15, 2015. Based on the PDA, the City obtained input at the Scoping Meeting. The most significant concerns expressed by the community at the Scoping Meeting pertained to traffic on Santiago Canyon Road and Cannon Road, the preservation of Santiago Creek as a greenway, open space, flooding, and elimination of the current sand and gravel operation. For the last 10 months, the City, the Applicant, and community representatives from OPA, Mabury Ranch HOA, and The Reserve HOA have worked together in addressing these concerns, as well as other related matters. This effort has resulted in the following modifications, reductions, and/or changes to the Project:

1. The number of housing units has been reduced from 150 to 129 and those units are now located in the westernmost portion of the property, adjacent to the County Property. The development will consist of housing types and lot sizes compatible with the surrounding neighborhoods.

2. The Property Owner proposes to widen Santiago Canyon Road and restripe Cannon Road prior to the occupancy of any housing units. The Cannon Road restriping shall be initiated within 60 days after the Tentative Map approval and all appeal periods have expired.
3. The Property Owner proposes to fund approximately $4,100,000.00 in landscape and other improvements for the Santiago Creek Greenway. Said Improvements are to be completed or funded prior to the sixtieth certificate of occupancy.

4. The Property Owner is proposing to fund $1,000,000.00 in local trail improvements to be coordinated with the OPA and the City of Orange prior to the first certificate of occupancy.

5. The Property Owner will finance and fund the acquisition of the RIDGELINE PROPERTY, consisting of approximately 50 acres by the City of Orange or nonprofit entity for permanent open space, thus ending years of community uncertainty and division prior to the first certificate of occupancy.

6. The Property Owner will provide $2,000,000.00 prior to the first certificate of occupancy in funding for the relocation of the Mara Brandman Arena to the Ridgeline property.

2.3.2 - Project Summary

A Specific Plan will be prepared to provide a comprehensive evaluation of the land uses proposed for the site and will include land use regulations, infrastructure plans, zoning and development regulations, design guidelines and implementation criteria. The process enables the development of the property and implementation of proposed improvements, both short-term and long-term, while also addressing infrastructure improvements and community services. The applicant requests City consideration of the following components:

- General Plan Amendment
- Zone Change (Trails at Santiago Creek Specific Plan)
- Development Agreement offering additional community benefits and vesting rights associated with project approvals for a period of time mutually agreed upon by the City and applicant.
- An EIR for disclosure and assessment of potential project impacts and establishment of mitigation measures and a Mitigation Monitoring and Reporting Program.

The Specific Plan proposes the Greenway/Open Space and Santiago Creek environs in the north portion of the site and a Grasslands/Open Space element in the eastern portion of the site abutting the adjacent Reserve residential neighborhood. A Single-Family Detached Residential parcel is proposed in the south-central and southwestern portion of the site abutting the adjacent County-owned vacant parcel west of the project site. The residential neighborhood will be accessed from Santiago Canyon Road across from Nicky Way.

The proposed land use plan is shown in Exhibit 2-8, a summary of the project is listed in Table 2-1, and a breakdown of each land use is provided below.
Exhibit 2-8

Proposed Land Use Plan

CITY OF ORANGE • TRAILS AT SANTIAGO CREEK SPECIFIC PLAN
ENVIRONMENTAL IMPACT REPORT

LAND USE SUMMARY

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<th>Land Use Type</th>
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<td>Managed Vegetation</td>
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Table 2-1: Project Land Use Summary

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<th>% of Site</th>
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Residential Uses

The Trails at Santiago Creek proposes a well-planned Single-Family Detached Residential neighborhood comprising 40.2 acres within Planning Area D, located in the south-central and southwestern portions of the site abutting the adjacent vacant County-owned parcel. The project proposes 129 single-family detached lots with a minimum lot size of 8,000 square feet. Homes will be one-story and two-story. Please refer to Exhibit 2-8: Proposed Land Use Plan.

The residential neighborhood within the project will be notable. The neighborhood landscape will provide for a street tree program with tree canopies that will reduce the visual scale of the street thus slowing traffic movement and providing a more “intimate” walking experience. Paseos will link the neighborhood to the surrounding open space trail system. The residential architecture will be compatible with the surrounding neighborhoods and the City of Orange, thus being part of the whole, while also assisting in establishing the neighborhood’s own identity. Homes will be designed to reinforce the pedestrian scale of the neighborhood by incorporating second floor setbacks and covered front porches and entryways that address the sidewalk and reduce the scale of the homes.

Santiago Creek Greenway and Open Space Areas

The open space at The Trails at Santiago Creek will be approximately 69.0 acres and will comprise natural hillsides, re-established grasslands, a restored Santiago Creek riparian corridor and a managed vegetation/fuel modification zone. The open space will occupy approximately 63.2% of the site and will include:

- Planning Area A—Greenway Open Space and Santiago Creek Riparian Corridor: 40.2 acres
- Planning Area B—Grasslands Open Space (includes Santiago Canyon Road trail easement): 20.5 acres
- Planning Area C—Managed Vegetation/Fuel Modification zone: 8.3 acres
Santiago Creek, which meanders across the site in an east-to-west trend, is an incised perennial USGS blue-line drainage course that primarily supports southern cottonwood-willow riparian forests as well as the development of fringe wetlands. The creek bifurcates into two stream beds in the center of the site, ultimately rejoining in the western portion of the property.

The Greenway Open Space and Santiago Creek, with its riparian and wetland habitats, provides an environment that supports both on-site “live-in” wildlife as well as a movement corridor for regionally oriented wildlife. Off-site to the east the Santiago Creek open space corridor provides a link to Santiago Oaks Regional Park and the natural open space beyond. Off-site to the west the Santiago Creek open space corridor connects with the Santa Ana river environs with its ponds and tributaries.

The Grassland area, located south of Santiago Creek, has been disturbed over the years due to commercial operations on the site and is intended to be restored as a natural grassland interspersed with other plant communities and seasonal wildflowers.

The Managed Vegetation/Fuel Modification zone is located south of Santiago Creek on the north facing slopes and acts as a vegetative buffer between the open space and proposed residential neighborhood. This 130-foot-wide buffer zone will extend the full length of the residential neighborhood’s northern edge and will comprise plantings that are compatible with on-site plant communities while being responsive to fuel management policies. A 20-foot wet zone falls within the rear yard of the residential lots along this edge.

The project proposes uses within its open space components that will be compatible with and reflective of uses as described in the Santa Ana River, Santiago Creek Greenbelt Plan (1971), and the Santa Ana River/Santiago Creek Greenbelt Implementation Pan (1976). Other documents that guided proposed uses and/or trails included the City of Orange General Plan Circulation and Mobility Section, the East Orange General Plan (1975), the Orange Park Acres (OPA) Specific Plan (1973), and the Riding and Hiking Trails Map of Orange Park Acres and Vicinity.

Responsibility for open space grasslands and trails management and maintenance will be discussed as part of the ongoing process.

**Trails, Open Space, and Recreation**

Taking into consideration the previously referenced documentation and the quality, character and intended restoration of the project’s open space planning areas, the open space within The Trails at Santiago Creek avails itself to a variety of passive recreational uses including trailheads, multi-use recreational trails and trail-side resting areas. Please refer to Exhibit 2-9.

**Trailhead**

In the southerly portion of the site within Planning Area B, the restored grassland area, a trailhead is proposed. Intended to be an informative entryway into the greenway and open space environs there will be informational signage and trail maps, equestrian hitching rails and watering station, bike racks, and rustic benches and tables for resting and/or waiting for others. This area will be a gathering place for riders and hikers to meet and join up with friends and community colleagues for mutual recreation and trail enjoyment.
Exhibit 2-9
Preliminary Greenway, Open Space and Trails Plan
A variety of recreational trails for combined uses of hiking, bicycling, and horseback riding will traverse the project site as described in the following. Trails are proposed to be unpaved (decomposed granite or similar) in keeping with the natural setting.

**Trails**

**Trail A**

Along the north side of E. Santiago Canyon Road, in addition to the existing Class II bike trail, an off-street recreational trail will extend along the entire length of the project site. This trail will provide continuity from the existing recreation trail that parallels the roadway east of the project site, with the intention of eventually connecting to future planned trails off-site to the west (provided by others).

**Trail B**

This recreational trail will extend northward from the E. Santiago Canyon Road trail, pass through the project’s trailhead and meander through the grassland area in the southern portion of the site (Planning Area B). Within the grassland parcel the trail will pass open areas that can be used by the community at large for informal passive gatherings and activities such as casual picnics, kite-flying, and Frisbee play.

Continuing northward Trail B will cross the Santiago Creek riparian corridor via a bridge that will span the creek environs. The bridge, with a span in excess of 100 feet, will be constructed of wood and/or steel and be of a character in keeping with the locale and setting. The bridge will be located toward the easterly end of the creek corridor in the most feasible location to be the least intrusive to the creek environment.

**Trail C**

This trail is an existing unpaved recreational trail known as the Santiago Creek Trail. It is predominantly off-site abutting the project’s boundary and Planning Area A, the Greenway Open Space, with a short length running within the property along the northwest boundary. The trail begins at Cannon Street and trends along the project’s northwesterly boundary to Mabury Avenue, where it turns east and runs off-site along the entire northern boundary of the project site between Mabury Avenue and the Greenway Open Space. At the project’s eastern boundary, the trail continues off-site to the Santiago Oaks Regional Park via the Santiago Creek open space corridor.

**Trail D**

This recreational trail trends east/west through Planning Area A, the greenway open space on the north side of the project site and above Santiago Creek. The trail traverses the sloping land on the east and west sides and meanders through the open grassland area in the central portion of the site, providing for overviews of the Santiago Creek corridor and its woodland communities. The trail connects at three points with Trail C, the Santiago Creek Trail, allowing for an enjoyable loop through varying terrain, with Trail B connecting south to E. Santiago Canyon Road, and also to Cannon Road abutting the westernmost portion of the site.

**Trail E**

Trail E is a seasonal trail that is intended to allow users the opportunity to travel down into and along the Santiago Creek stream bed (Planning Area A) during the dry season and during times of the year.
of low water flow to become enveloped in the southern cottonwood-willow riparian forest that inhabits the creek corridor. The trail would meander through the broader expanses of the creek bed environs in the west-central portion of the site, then align itself closely with the creek bed on the eastern and western portions of the site where the creek corridor takes on more of a “ravine” character. It is intended that the trail would continue off-site to the east and west. Mechanisms such as trail gates, signage and monitoring of site conditions will be necessary to restrict trail access during the wet season or periods of high water flow.

**Trail F**
A network of trails will extend from a proposed residential neighborhood located in the southerly portion of the project site and will connect with adjacent open space and the project-related recreational trail network. Along the south side of Santiago Creek, above the creek at the top of the slope and passing through Planning Area C, this trail will provide dual purposes: as a link to the adjacent recreation trail system and as access for managed vegetation/fuel modification area maintenance. This trail will have a width of 20 feet and a surface of decomposed granite but will be constructed to carry vehicle weight. As such, this trail can also be used by emergency vehicles.

**Trail G**
This trail is a proposed pedestrian/bike trail only, providing access to/from the recreational trail system and the residential neighborhood, Planning Area D.

**Rest Areas**
At appropriate locations along the project’s trail system trailside rest areas are proposed. These rest areas will have rustic benches, a horse hitching rail, and a bike rack. They are provided to allow trail users the opportunity to rest and take a break, take in the view and setting, and enjoy the company of other trail users.

**Parks**
Through extensive meetings and dialogues with representatives of adjacent residential neighborhoods including Orange Park Association, Mabury Ranch Homeowners Association, and The Reserve Homeowners Association, it was mutually agreed upon that no active parks or recreational facilities would be proposed on the project site, but rather passive recreational uses and trails would be incorporated into the plan as have been described above. Within the residential neighborhood, Planning Area D, the existing Handy Creek OCFCFD Easement provides for an open space extension into the neighborhood and the opportunity for trail/paseo linkage from the residences to the surrounding recreational trail network. It is intended that this feature will become a linear park/paseo with benches and accent plantings to complement the meandering trails.

**Circulation Plan**
The Circulation Plan for The Trails at Santiago Creek provides for the movement of vehicular traffic while creating an environment for pedestrians, bicyclists, and equestrian riders through the inclusion of both a regional and local on-site trail system. The trail system provides internal connectivity within The Trails at Santiago Creek, as well as the potential for external connections to the greater Orange community, Santiago Oaks Regional Park, the existing regional trail system, and other off-site destinations and amenities. For existing circulation, please refer to Exhibit 2-11a. For proposed circulation, please refer to Exhibit 2-11b: Proposed Circulation.
Exhibit 2-10a
Pre-Development Agreement Alternatives A-D
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Exhibit 2-10b
Pre-Development Agreement Alternatives E-F

Pre-Development Agreement Alternative E

Pre-Development Agreement Alternative F - Existing City of Orange General Plan
**Vehicle Circulation**

*Existing*

Regional access to the site is provided via the SR-55 Freeway, SR-91 Freeway, and the SR-241/SR-261 Freeways (Toll Roads). The principal local network of streets serving the proposed project includes Santiago Canyon Road and Cannon Street. The Project site is located on the north side of Santiago Canyon Road between Cannon Street and Orange Park Boulevard.

There is no existing public access to the Project site. Private controlled access to the Project site occurs from East Santiago Road via two gated and monitored entrances.

*Santiago Canyon Road* is generally a four-lane divided roadway that borders the Project site on the south. On-street parking is generally not permitted along this roadway within the vicinity of the Project. The posted speed limit on Santiago Canyon Road adjacent to the project site is 50 miles per hour (mph). In the vicinity of the project site traffic signals control the intersections of Santiago Canyon Road at Hewes Street, Cannon Street, Orange Park Boulevard and Meads Avenue. Approximately 5 acres in the southeastern portion of the Project site are used for materials recycling, including the crushing of boulders, bricks, rocks, etc. Access to the materials recycling area is provided via a controlled entrance along East Santiago Canyon Road. Materials generated by this operation have historically been used within and transported off the Project site.

*Cannon Street* is a four-lane divided roadway oriented in a north-south direction. On-street parking is generally not permitted along this roadway within the vicinity of the Project. Adjacent to the project site the posted speed limit on Cannon Street is 45 mph.

Current traffic volumes resulting from the existing on-site rock crushing operation generates approximately 686 daily trips, of which over 500 of those trips are truck traffic. Traffic movement on Santiago Canyon Road and through intersections in the vicinity of the proposed project is less than desirable at peak hours.

*Proposed*

Access to the project will be provided via one proposed full access signalized entry road, located directly opposite Nicky Way, along Santiago Canyon Road. No parking will be allowed along either side of the entry road. Sidewalks will be located on each side of the entry road separated by a landscaped parkway.

While the proposed project has the potential for a net increase of daily trips (542), but which also results in a significant reduction of the current rock crushing operations traffic generated by heavy-trucks, the project proposes several improvements to the surrounding roadways and intersections, thus ensuring increased capacity and adequate traffic flow in the area. These are improvements that would not be incorporated in the absence of the project. These capacity improvements involve roadway widening and/or re-striping to reconfigure (add lanes) to specific approaches of key intersections. The identified improvements are expected to:

- Mitigate the impact of existing traffic, project traffic and future non-project (ambient traffic growth and cumulative project) traffic; and
- Improve Levels of Service to an acceptable range and/or to pre-project conditions.
To ensure that adequate ingress and egress to the project site can occur from Santiago Canyon Road without impeding through traffic flow, the following Project Feature Improvements will be provided at the project’s entry across from Nicky Way:

- Construct the project’s entry road on the north side of the intersection and provide one inbound lane and two outbound lanes (one left turn lane and one shared through-right turn lane). Widen and/or restripe Santiago Canyon Road to provide one eastbound left-turn lane and one westbound right-turn deceleration lane. Install a five-phase traffic signal with protected left-turn phasing in the east-west direction and permissive phasing in the north-south direction.

In addition to the above the following additional Voluntary Improvements will be provided:

- Santiago Canyon Road—Widen and restripe the north side of Santiago Canyon Road approximately 4 to 6 feet from the easterly project boundary to the existing free-right turn lane at Cannon Street to provide a third westbound through lane
- Cannon Street—Restripe Cannon Street from Santiago Canyon Road to Serrano Avenue to provide a third northbound through lane.

Within the proposed residential neighborhood (Planning Area D) local streets will be designed in accordance with the City of Orange 100 Series—Street Improvement Standards, Standard Plan 106 Local Streets, Case I and Case II. Streets will have one travel lane in each direction and sidewalks separated by a landscape parkway. Parallel parking will be allowed on one or both sides of the street pending neighborhood design.

**Non-Vehicular Circulation**

*Existing*

Pedestrian circulation is provided via existing public sidewalks along the south side of Santiago Canyon Road east of the project site terminating at the Mara Brandman Equestrian Center and resuming west of Nicky Way. There is no public sidewalk on the north side of Santiago Canyon Road abutting the project site or west of the site. Lastly, there are existing public sidewalks of both the east and west sides of Cannon Street.

Class II bike lanes (on-street bike lanes delineated by painted strips and other features) exist along the north and south sides of Santiago Canyon Road and the east and west sides of Cannon Street. A public Recreation Trail currently exists along the north side of Santiago Canyon Road adjacent to the existing Reserve neighborhood to the east of the project site. Along the north boundary of the site exists the Santiago Creek Bike Trail extending from Cannon Street east to the easterly project boundary and further on to Santiago Oaks Regional Park.

*Proposed*

As described above, in Santiago Creek Greenway and Open Space Areas, numerous documents have been reviewed and taken into consideration in preparing the pedestrian, bicycle and equestrian trail plans.
network for the project. Below is a brief description of the various components of this network. Please refer to Trails, Open Space and Recreation, above, for a more detailed discussion.

A variety of public recreational trails will traverse the project site, providing shared use of hiking, biking and horseback riding on decomposed granite trail surfaces. Along the north side of E. Santiago Canyon Road, in addition to the existing Class II bike lane, an off-street recreational trail will extend along the entire length of the project site. This trail will provide continuity from the existing trail that parallels the roadway east of the project site, with the intention of connecting to future planned trails off-site to the west (provided by others). This 10-foot-wide trail will be separated from Santiago Canyon Road by a minimum 6-foot-wide landscaped Parkway measured from the back of curb within a minimum 18-foot-wide easement, as per the City of Orange Recreational Trail Master Plan (RTMP) Detail #2. Trail fencing between the trail and the street shall also be consistent with the City’s RTMP Detail #14 and shall be placed outside of the trail tread area.

Throughout open space Planning Areas A, B, and C, a network of 10-foot-wide recreational trails will meander across the land providing public access to the restored open space and the Santiago Creek environs on this once private land, and will connect to the previously described recreational trail along Santiago Canyon Road and to the existing Santiago Creek Trail along the project’s northern boundary and Mabury Avenue. The project’s recreational trail network will also connect to Cannon Street to the west of the project site.

The open space trail network will also connect to the residential neighborhood in Planning Area D via Hike/Bike trails extending through landscape paseos and connecting to the neighborhood sidewalk and street system. Similar to the recreation trails, these trails will be 10 feet wide and constructed with decomposed granite. Within the residential neighborhood all streets will have sidewalks on both sides.

It is the intent of The Trails at Santiago Creek to provide a recreational trail system that avails the open space areas and the Santiago Creek environs to the community of Orange and the general public at large, as well as the project’s residential neighborhood, and becomes an integral part of the City’s and County’s trail master plans via connectivity opportunities.

**Emergency Access**

Emergency vehicle access is to be provided on the project site consistent with the City of Orange Fire Department requirements. The City Fire Department staff will review the project’s Site Plan and TTM upon preparation to verify the adequacy of the emergency vehicle access. As indicated on Exhibit 2-11b: Proposed Circulation, emergency access is proposed from Santiago Canyon Road to the proposed single-family detached residential neighborhood (Planning Area D) in two locations. One access point is located in the southeast end of Planning Area D, and the other access point is located in the southwest portion of Planning Area D.

Access will be controlled via a knockdown bollard or gate off Santiago Canyon Road. A 14-foot-wide travel surface will be provided within a 30-foot-wide easement, allowing emergency access from Santiago Canyon Road to the interior neighborhood street system.
No roadways are proposed within open space Planning Areas A, B, or C. Currently, Orange County Flood Control accesses the site from the north via a gated access point at Mabury Avenue and Yellowstone Blvd. This access will still be provided once the project is complete and will be via the proposed trail system.

In addition, Orange County Flood Control and the City of Orange Fire Department will have access from Cannon Street via County-owned property to the proposed 20-foot-wide multi-use recreational trail along the south side of Santiago Creek in Planning Area C. This trail provides access for the managed vegetation and fuel modification zone maintenance and may also be used by the Fire Department and emergency vehicles in case of emergency.

**Grading and Earthwork**

The proposed project includes extensive remediation of bad soils conditions left as a byproduct of the former mining operation. This will necessitate the import of approximately 700,000 cubic yards of new clean materials and the export of approximately 400,000 cubic yards of silty soils. The blend of imported materials will be based on the recommendation of the project’s soils engineer and will include asphalt, concrete, rock, and soil to be mixed in with the materials found onsite currently.

For purposes of clarity, “backfilling with inert materials” has been allowed as a permitted use under all versions of the City’s SG District Ordinance, including that in effect today. (See Orange Municipal Code § 17.32.020; Ordinance No. 54-73, p. 3.) In 2015, Milan agreed to voluntarily and temporarily suspend material imports for backfill and stockpiling. In 2016, Milan entered into PDA with the City which noted the voluntary suspension and provided for Milan to prepare and implement an Interim Remediation Plan “which may include interim grading and soil remediation which resulted in a lowering of the existing sand and gravel material stockpiles” on the Property.

**Utilities**

**Storm Drainage**

The proposed project would install a network of storm drainage facilities within the project site consisting of inlets, underground piping, and basins. This system would serve 72.58 acres of the site and direct runoff to a 3.7-acre-foot capacity stormwater detention basin in the western portion of the site. A flow control structure will be installed within the detention system to meter the outflow from the site to below predevelopment levels. Catch basins will be located at various points within the site to capture subarea flows. The system is designed to detain flows from a 100-year storm event as required by the Orange County Hydrology Manual.

Two sub drainage areas will flow directly to Santiago Creek without detention. One of these areas is approximately 1.46 acres directly over the Handy Creek Channel. This flow will be directed to the Handy Creek Channel. The other area is the trail system adjacent to Santiago Creek and totals 6.20 acres.
This flow will be picked up via a storm drain system, which will outlet at the same location as the detention basin outlet. The outlet structure from the detention basin to Santiago Creek will be protected by riprap and an energy dissipater.

**Potable Water**

The City of Orange Water Division would provide potable water service to the proposed project. Two existing water mains are located within E. Santiago Canyon Road and measure 18 inches and 24 inches in diameter, respectively.

The proposed project would install a network of underground water lines within the project site that would connect to one or both of the existing water mains within E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

**Wastewater**

Orange County Sanitation District (OCSD) would provide wastewater collection and treatment to the proposed project. An existing OCSD trunk sewer main is located within E. Santiago Canyon Road that measures 18 inches in diameter.

The proposed project would install a network of underground sewer piping within the project site that would connect to the existing sewer main within E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

**Electricity**

Southern California Edison (SCE) would provide electrical service to the proposed project. A network of underground electrical lines would be installed within the project site and connect to existing SCE facilities along E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

**Natural Gas**

The Southern California Gas Company (SoCalGas) would provide natural gas service to the proposed project. A network of underground natural gas lines would be installed within the project site and connect to existing SoCalGas facilities along E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

**Comparison to Prior Development Proposals**

Table 2-2 compares the current Trails at Santiago Creek Specific Plan proposal with the previous Fieldstone, Rio Santiago, and Hanson Properties proposals.
Table 2-2: Comparison to Prior Development Proposals

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Unit Count and Acres</th>
<th>Open Space/ Greenway</th>
<th>Comparison of Previous Plan vs Current Plan¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fieldstone (Previous)</td>
<td>189 single-family dwelling units located on approximately 50 acres</td>
<td>36.5 acres of open space and recreation (33%)</td>
<td>The Fieldstone Previous Plan would add 60 additional units, and would provide 23.5 fewer acres of open space and recreation, with no greenway proposed.</td>
</tr>
<tr>
<td>Rio Santiago (Previous)</td>
<td>395 single-family dwelling units located on 83 acres;</td>
<td>50 acres of/open space greenway (45%) and 10 acres of recreation</td>
<td>The Rio Santiago Previous Project would add 266 additional units, and would provide 1 less acre of open space greenway and recreation.</td>
</tr>
<tr>
<td>Hanson Properties (Previous)</td>
<td>25 single-family dwelling units located on 16.3 acres</td>
<td>N/A</td>
<td>The Hanson Properties Previous Project would develop the north bank of Santiago Creek, whereas the Proposed Project would create open space in that area.</td>
</tr>
<tr>
<td>Trails at Santiago Creek Specific Plan (Current)</td>
<td>129 single-family dwelling units located on 40.2 acres</td>
<td>17.8 acres of open space (16%) and 40.2 acres of greenway (37%)</td>
<td>—</td>
</tr>
</tbody>
</table>

Note:
¹ For informational purposes only. See Section 3.10, Land Use for additional information.
Source: FCS, 2016.

Project Implementation

Implementation of the proposed project will be primarily dictated by economic conditions and may occur on a phased basis over a period of years. However, for the purposes of providing a conservative, worst-case analysis in this EIR, it will be assumed that the entire project would be developed in a single phase that takes 24 months to complete. Construction would begin in January 2019 and the project would be completed by January 2021.

2.4 - Project Objectives

The objectives of the proposed project are to:

OBJ-1. Locate single-family detached residential units in the most suitable areas of the project site and preserve other areas for open space and greenway.

OBJ-2. Preserve and protect Santiago Creek by abating the remnants of the resource extraction activities and establishing a greenway along the creek corridor.

OBJ-3. Promote land use compatibility with neighboring residential uses through the use of locating landscaped setbacks, and the development of a compatible housing product and lot size to the adjoining uses.
OBJ-4. Develop a network of publicly accessible trails within the project site that provide access to Santiago Creek and Santiago Oaks Regional Park.

OBJ-5. Lessen the noise, improve air quality, and reduce traffic impacts from the existing materials recycling and backfilling operations within the project site.

OBJ-6. Provide a circulation system that will minimize adverse effects on local residential neighborhoods and encourage pedestrian and bicycle circulation.

OBJ-7. Provide an infrastructure system, including sewer, water, and storm drain systems that will adequately serve full build-out of the proposed project.

OBJ-8. Improve local circulation by widening of Santiago Canyon Road and restriping Cannon Road prior to the first certificate of occupancy.

2.5 - Intended Uses of this Draft EIR

This Draft EIR is being prepared by the City of Orange to assess the potential environmental impacts that may arise in connection with actions related to implementation of the proposed project. Pursuant to CEQA Guidelines Section 15367, the City of Orange is the lead agency for the proposed project and has discretionary authority over the proposed project and project approvals. The Draft EIR is intended to address all public infrastructure improvements and all future development that are within the parameters of the proposed project.

2.5.1 - Discretionary and Ministerial Actions

Discretionary approvals and permits are required by the City of Orange for implementation of the proposed project. The project application would require the following discretionary approvals and actions, including:

- A General Plan Amendment to Change the City’s General Plan Designation for the site from Resource Area (RA) to Low Density Residential (LDR 2.1-6 Du/Ac) and Open Space (OS); and from Low Density Residential (LDR2-6 Du/Ac) to Open Space (OS).

- A Zone Change to re-designate the site designation from Sand and Gravel (S-G) and Single Family Residential 8,000 sf (R-1-B) to Specific Plan (SP), consistent with the Trails at Santiago Creek Specific Plan.

- A Development Agreement offering additional community benefits and vesting rights associated with project approvals for a period of time mutually agreed upon by the City and applicant.

- Certification of an Environmental Impact Report for disclosure and assessment of potential project impacts and establishment of mitigation measures and a Mitigation Monitoring and Reporting Program.

Subsequent ministerial actions would be required for the implementation of the proposed project, including issuance of grading and building permits.
2.5.2 - Responsible and Trustee Agencies

A number of other agencies in addition to the City of Orange will serve as Responsible and Trustee Agencies, pursuant to CEQA Guidelines Section 15381 and Section 15386, respectively. This Draft EIR 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 Army Corps of Engineers (USACE)
- United States Fish and Wildlife Service
- California Department of Fish and Wildlife (CDFW)
- California Department of Toxic Substances Control (DTSC)
- Santa Ana River Regional Water Quality Control Board (RWQCB)
- South Coast Air Quality Management District
- County of Orange

Actions that are necessary to implement the project that must be taken by other agencies are:

- Issuance of Section 404 Permits (USACE)
- Issuance of a Lake and Streambed Alteration Agreement (CDFW)
- Issuance of Section 401 Water Quality Certification (RWQCB)
SECTION 3: ENVIRONMENTAL IMPACT ANALYSIS

Organization of Issue Areas

This Draft Environmental Impact Report (Draft EIR) 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 3.18 discuss the environmental impacts that may result with approval and implementation of the proposed project.

Issues Addressed in this EIR

The following environmental issues are addressed in Section 3:

- Aesthetics, Light, and Glare
- Agriculture Resources and Forest Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- 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 EIR 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 EIR 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:

<table>
<thead>
<tr>
<th>Code</th>
<th>Environmental Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES</td>
<td>Aesthetics, Light, and Glare</td>
</tr>
<tr>
<td>AFR</td>
<td>Agriculture Resources and Forest Resources</td>
</tr>
<tr>
<td>AIR</td>
<td>Air Quality</td>
</tr>
<tr>
<td>BIO</td>
<td>Biological Resources</td>
</tr>
<tr>
<td>CUL</td>
<td>Cultural Resources</td>
</tr>
<tr>
<td>GEO</td>
<td>Geology and Soils</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas Emissions</td>
</tr>
</tbody>
</table>
Comparative Analysis of Scenarios

This EIR will evaluate the proposed project plus three additional scenarios that consist of modifications to the project. Because each scenario contemplates less residential development than the proposed project, they will be evaluated at a qualitative level in each topical section.
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 and the site and its surrounding area. Descriptions and analysis in this section are based on site reconnaissance by FCS, as well as review of the City of Orange General Plan.

3.1.2 - Environmental Setting

Visual Character

Regional Setting
The City of Orange, population 141,240, is located in central Orange County at the base of the Santa Ana Mountains. Orange is characterized by a mix of contemporary low-rise suburban development in the northern and eastern portions of the city limits; early 20th century development in the historic Old Towne area in the western and central portion of the city limits; and denser mid-rise development near the “Orange Crush” interchange\(^1\) in the southern portion of the city. Wholly contained within the Orange city limits is the City of Villa Park, which exhibits similar visual attributes. The eastern portion of Orange sits on the lower slopes of the Santa Ana Mountains and thus features lower-density residential development and open space areas.

Local Setting
The approximately 109-acre project site contains disturbed, privately owned undeveloped land that previously supported mining activities and currently supports a sand gravel operator in accordance with the existing Sand and Gravel zoning (Orange Municipal Code Chapter 17.32). The project site is comprised of 12 parcels and is bisected by Santiago Creek in an east-west direction. The site contains gently sloping terrain, with an overall change in elevation from 456 feet above mean sea level in the northeast corner to 344 feet above mean sea level in the southwest corner. An approximately 10-acre, semi-oval-shaped raised pad is located in the eastern portion of the site. The pad sits roughly 15 feet higher than the mining area to the west.

Approximately 40 acres between Santiago Creek and E. Santiago Canyon Road contains remnants of the mining operation and is the location of the ongoing sand and gravel operation. This area is characterized by soil piles and berms, and unpaved roads. Near E. Santiago Canyon Road is an approximately 5-acre area that supports a materials recycling operation that included apparatus for the crushing of boulders, bricks, rocks, and similar materials for recycling. Materials used for these operations originated primarily from off-site sources and the materials generated by these operations have historically been used both on-site and transported off-site. Ancillary uses included administration and maintenance buildings, caretaker residence, material testing laboratory, driver’s shack, rock crushing facilities, several above ground and below ground fuel storage tanks and two hot-mix asphalt plants.

\(^1\) The interchange of Interstate 5, State Route 22, and State Route 57.
Additionally, the previously mined portions of the site were “backfilled,” in which unsuitable materials were excavated and replaced with fill, pursuant to a grading permit issued by the City of Orange in 2011. It was anticipated that approximately 223,000 cubic yards of material would be imported to the site during the process, including concrete, asphalt and rock that would be crushed on-site. Approximately 2,000 cubic yards of material was anticipated to be excavated from the site for reuse and would be blended with the crushed import material for a total of 225,000 cubic yards of backfill. In 2015, the operator voluntarily temporarily suspended operations on the site, and limited rock crushing operations to a total of 15 consecutive business days in any six month period. The operator reserved the right to resume all operations consistent with the Sand and Gravel zoning.

Santiago Creek enters the site at the eastern boundary, flows west, and exits the western boundary at N. Cannon Street. The creek originates at Irvine Lake and is tributary to the Santa Ana River. The drainage feature splits near the central portion of the project site, with an upland area separating Santiago Creek into two rivulets. The average width of the drainage feature is approximately 55 feet, which includes the area between the ordinary high water mark and the adjacent defined wetland areas. Wetland areas are generally located on either side of the active channel. The creek corridor is not accessible to the public.

Natural vegetation within the site is primarily located along Santiago Creek. Plant communities include coast live woodland, coastal sage scrub, eucalyptus woodland, non-native grassland, ornamental, southern cottonwood-willow riparian forest, and undifferentiated open woodland. There are 323 trees located with the project site, of which the most common species are blue gum (eucalyptus), oak, willow, and palm; the proposed project would follow the City of Orange Tree Preservation Ordinance by replacing any removed trees in a no-less-than 1:1 ratio. Further discussion of on-site trees is found in Section 3.4, Biological Resources.

**Surrounding Land Uses**

The following is a summary of surrounding land uses. Exhibit 3.1-1 provides views of surrounding land uses.

**West**

The closed Villa Park Landfill and N. Cannon Street form the western boundary of the project site.

The 18-acre Villa Park Landfill occupies the northeast quadrant of the intersection of E. Santiago Canyon Road/N. Cannon Street and is owned by the County of Orange. The landfill operated from 1962 through 1966. The site is enclosed with a fence and contains groundwater monitoring wells and a landfill gas disposal system. The western and southern portions of the project site are visible from the landfill.

N. Cannon Street is a four-lane divided roadway and crosses Santiago Creek via a concrete bridge. A paved Class I bicycle/pedestrian path (Santiago Creek Bike Trail) is located along the west side of N. Cannon Street south of Santiago Creek. The western portion of the project site is visible from N. Cannon Street.
Single-family residential uses north of Mabury Avenue

Villa Park Landfill (Closed)

Mara Brandman Arena

Single-family residential uses south of E. Santiago Canyon Road

Source: FirstCarbon Solutions, 2016.

Exhibit 3.1-1
Surrounding Land Uses
North
Single-family residential uses (8,000-square-foot lots) and Mabury Avenue form the northern boundary of the project site. Detached, single-family dwelling units are located along the north bank of Santiago Creek. Mabury Avenue is a two-lane undivided roadway. An unpaved trail (Santiago Creek Trail) is located along the north bank of the creek, parallel to Mabury Avenue. The northern portion of the project site is visible from Mabury Avenue.

East
Santiago Oaks Regional Park and single-family residential uses (40,000-square-foot lots) form the eastern boundary of the project site. The Santiago Creek corridor contains dense vegetation. Detached, single-family dwelling units are located east of the project site. The eastern portion of the project site is visible from Santiago Regional Park and the single-family residential uses.

South
E. Santiago Canyon Road, a four-lane, divided roadway, forms the southern boundary of the project site. Detached single-family dwelling units (8,000- and 40,000-square-foot lots) are located south of the roadway. The Mara Brandman Arena is located at the intersection of E. Santiago Canyon Road and N. Nicky Way. The southern portion of the project site is visible from E. Santiago Canyon Road.

Scenic Vistas
A Scenic Vista, as defined by the City of Orange General Plan EIR, is a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public. Portions of the City are characterized by scenic vistas including undeveloped hillsides, ridgelines, and open space areas that provide a unifying visual backdrop to the urban environment. An abundance of scenic vistas occur in the largely undeveloped Santiago Hills II and East Orange portions of the planning area including Irvine Lake, grassy valleys, rugged hillsides, and winding canyons.

Viewscape Corridor
Several city roadways display scenic qualities and are designed as viewscape corridors by the County of Orange. Viewscape corridors are defined by the City's General Plan EIR as routes that traverse a corridor within which unique or unusual scenic resources and aesthetic values are found. The County of Orange designates viewscape corridors including portions of Jamboree Road, Santiago Canyon Road, and Newport Boulevard. The City does not contain any County-designated landscape corridors.

According to the Visual and Aesthetic Resources of the City's General Plan (page NR-8), Policy 7.2, (as shown in figure NR-4, Viewscape Corridors) the section of Santiago Canyon Road designated a viewscape corridor is located to the east of Jamboree Road and is not within the vicinity of the project site.

Scenic Resources
Scenic resources are defined as those landscape patterns and features that are visually or aesthetically pleasing and that, therefore, contribute affirmatively to the definition of a distinct community or region including, but not limited to, trees, rock outcroppings, and historic buildings. Scenic areas, open spaces, rural landscapes, vistas, country roads, and other factors interact to
produce a net visual benefit upon individuals or communities. Santiago Creek is considered a scenic resource by the City’s General Plan EIR.

**Light and Glare**

There are no existing sources of light and glare within the project boundaries. The proposed project may include light poles, solar panels, window glazing, and lights/glare typically associated with residential uses. To preserve the naturalness of the site, light and glare from the proposed project will be managed in accordance with the City of Orange Zoning Ordinance. The City of Orange Zoning Ordinance regulates lighting and stipulates that lighting and glare shall be controlled in order to prevent glare or direct illumination on surrounding premises, public sidewalks, or thoroughfares.

### 3.1.3 - Regulatory Framework

#### Local

**City of Orange**

*General Plan*

The General Plan sets forth the following goals and policies that are relevant to aesthetics, light, and glare:

**Land Use Element**

- **Goal 6.0:** Advance development activity that is mutually beneficial to both the environment and the community.
- **Policy 6.1:** Ensure that new development is compatible with the style and design of established structures and the surrounding environment.
- **Policy 6.3:** Establish and maintain greenways, and pedestrian and bicycle connections that complement the residential, commercial and open space areas they connect.
- **Policy 6.4:** Create and maintain open space resources that provide recreational opportunities, protect hillside vistas and ridgelines, and conserve natural resources.
- **Policy 6.6:** Enhance the walkability of both new and current development.
- **Policy 6.7:** Integrate natural amenities and connections, including waterways and wildlife corridors, within the design of urban and suburban spaces.

- **Goal 7.0:** Promote coordinated planning among City departments and agencies, property owners, residents, special districts, and other jurisdictions in the region.
- **Policy 7.5:** Work with and encourage other agencies and service providers to minimize potential visual and environmental impacts of their facilities on Orange.

**Natural Resources Element**

- **Goal 7.0:** Protect significant view corridors, open space, and ridgelines within the urban environment.
- **Policy 7.1:** Preserve the scenic nature of significant ridgelines visible throughout the community.
- **Policy 7.2:** Designate Santiago Canyon Road east of Jamboree Road as a City Scenic Highway to preserve the scenic nature of the open space adjacent to the road.

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• **Policy 7.3**: Encourage the development of landscaped medians and parkway landscaping along arterial streets in public and private projects, and encourage the state to provide freeway landscaping.

• **Policy 7.4**: Coordinate with Southern California Edison and other utilities to place utility lines underground wherever possible.

• **Policy 7.5**: Encourage the retention and enhancement of scenic corridors and visual focal points within the community.

**City of Orange Municipal Code**

The City’s Zoning Ordinance regulates lighting. Section 17.12.030 states:

The following provisions shall apply:

A. Lighting on any premises shall be directed, controlled, screened or shaded in such a manner as not to shine directly on surrounding premises. Furthermore, lighting on any residential property shall be controlled so as to prevent glare or direct illumination of any public sidewalk or thoroughfares.

The City’s Tree Preservation Ordinance (Municipal Code Chapter 12.32) protects all trees, regardless of species, that measure a minimum 10.5 inches in circumference, measured at a point 24 inches above the ground. The purpose of the Ordinance is provided below.

The primary concern of the City Council of the City is the regulation of large scale tree removal from undeveloped property in that large parcels of undeveloped acreage are more likely to have a vast number of trees, the removal of which is more likely to have an adverse effect upon the surrounding environment. Past destruction of trees on such property has not only interfered with the natural scenic beauty and tourism of the City, but also greatly diminished the ecological value of such natural vegetation.

Other areas of the Code related to aesthetics are not applicable to the proposed project because of the Planning Community (PC) zoning allows for the Specific Plan (SP) to create its own design standards. The Residential Infill Guideline does not apply to the proposed project because the proposed project is a subdivision consisting of more than four lots.

**Grading Guidelines**

The Orange City Council adopted the Guidelines for Landform Grading and Planting on April 12, 1988, which establishes policies designed to preserve visually significant ridgelines. Many of these ridgelines are identified on the General Plan Land Use Policy Map and no development or grading is permitted in areas so designated.

**3.1.4 - Methodology**

FCS evaluated potential project impacts on aesthetics, light, and glare through site reconnaissance and review of applicable plans and policies. FCS personnel visited the project site and surrounding land uses in December of 2016; documented the site conditions through photographs and notation;
and reviewed aerial photographs, topographical maps, street maps, project plans, and elevations to identify surrounding land uses and evaluate potential impacts form project development. The City of Orange General Plan was reviewed to determine applicable policies and design requirements for the Project. Project plans and design guidelines were reviewed to determine compliance with the requirements of the General Plan.

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? (Refer to Section 7, Effects Found Not To Be Significant.)

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?

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**

The City of Orange’s General Plan EIR defines a scenic vista as a viewpoint that provides expansive views of a highly valued landscape for the benefit of the general public.

The only portion of the project site that could be considered a scenic vista would be the Santiago Creek Trail along the north bank of Santiago Creek. (The trail passes through several heavily vegetated areas, which limits viewpoint opportunities.) The balance of the project site is closed to public access and secured with a fence.

A greenway would be established along the creek corridor and the undeveloped land along the north bank of the creek would be permanently protected as open space. Thus, scenic views from the Santiago Creek Trail would not be affected by the project.

Additionally, a trail network is proposed to be developed within the project site that would connect N. Cannon Street and Santiago Oaks Regional Park. This would create new opportunities for scenic vistas.
In summary, the proposed project would not significantly impact designated scenic resources, including views of the project and from the project vicinity. 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-2: | The project would not substantially degrade the existing visual character or quality of the site and its surroundings. |

**Impact Analysis**
Implementation of the project would represent a change from disturbed undeveloped land to residential uses on approximately 40.2 acres of the southern portion of the site. Other areas of the project would be preserved for recreation and open space purposes. In addition, the project would include a multipurpose trail network for biking, hiking, and horseback that would connect N. Cannon Street and Santiago Oaks Regional Park. The following discusses the potential visual character impacts of these proposed changes.

The approximately 109-acre site contains disturbed, undeveloped land that previously supported mining activities. The project proposes to develop approximately 40.2 acres of residential uses, and preserve the remaining acreage for recreation and open space. Natural vegetation within the site is primarily located along Santiago Creek. There are 323 trees located within the project site, with the most common species being blue gem (eucalyptus), oak, willow, and palm.

The residential uses would occupy the 40.2 acres in the southern and eastern portion of the site between Santiago Creek and E. Santiago Canyon Road. This area coincides with the former mining area and the oval-shaped raised pad. Open space and residential uses would occupy the balance of the project site. Santiago Creek and the area north of the creek would be permanently preserved as greenway.

The area located south of the creek and west of the residential uses would be occupied by open space and recreation uses. This latter area would serve as a buffer between the adjoining Villa Park Landfill and the proposed residential uses. Additionally, a trail would be developed along the south bank of Santiago Creek that would connect N. Cannon Street and Santiago Oaks Regional Park.

While development of the residences on site would change the character of approximately 40.2 acres of the project site to residential uses, and the remaining acreage to open space and recreation, these changes would not result in a significant impact. In addition, the residential development area would be compatible with surrounding uses and consistent with City policies related to aesthetics.
Therefore, the project would not substantially degrade the visual quality of the project area or its surroundings, and impacts related to changed character would be considered 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.

**Light and Glare**

| Impact AES-3: | The project may create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. |

**Impact Analysis**

The proposed project would install exterior lighting fixtures for safety and security purposes. Lighting would consist of building-mounted and freestanding fixtures around buildings, along drive aisles and along pedestrian routes.

Orange Municipal Code Chapter 17.12.030 regulates the installation of new exterior lighting fixtures and requires that they be directed, controlled, screened or shaded in such a manner as not to shine directly on surrounding premises. Furthermore, lighting on any residential property must be controlled so as to prevent glare or direct illumination of any public sidewalk or thoroughfares. The proposed project has the potential to use construction materials, solar panels and window glazing that have the potential to increase light and glare. However, the proposed project’s lighting shall be controlled to prevent glare and illumination within outside areas of the project site. Therefore, Mitigation Measure AES-3 requires the applicant to prepare and submit a lighting plan to the City of Orange for review and approval that complies the Municipal Code requirements. In summary, the City of Orange establishes restrictions on outdoor lighting that require fixtures to be directed downward, and of appropriate intensity. This would ensure that outdoor lighting associated with the proposed project would not create adverse spillover impacts onto adjoining uses or interfere with aviation activities. Impacts would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM AES-3**

Prior to issuance of building permits, the project applicant shall prepare and submit lighting plans to the City of Orange for review and approval. The plans shall demonstrate that all exterior lighting fixtures comply with Orange Municipal Code Chapter 17.12.030, which requires that new light fixtures be directed, controlled, screened or shaded in such a manner as not to shine directly on surrounding...
premises. Additionally, lighting on any residential property must be controlled so as to prevent glare or direct illumination of any public sidewalk or thoroughfares.

**Level of Significance After Mitigation**

Less than significant impact.
3.2 - Agriculture Resources and Forest Resources

This section describes the existing agricultural resources and potential effects from project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based in part on information provided by the California Department of Conservation Farmland Mapping and Monitoring Program, the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey, the California Department of Conservation’s Williamson Act and Farmland Mapping and Monitoring Program, and the City of Orange General Plan.

3.2.1 - Existing Conditions

Land Use Activities

The project site has supported surface mining activities (aggregate) and currently supports sand and gravel operations and materials recycling (such as asphalt and concrete crushing). The remaining portions of the project site are undeveloped.

Agricultural production intermittently occurred on the project site with the most recent production occurring from approximately 1993 through 2004. Agricultural production included fruit orchards and strawberry production. All agricultural uses on the site ceased in 2004. Additionally, the project site has also been used intermittently for storage of firewood and green waste recycling.

Farmland Mapping

The California Department of Conservation Farmland Mapping and Monitoring Program maps the project site as “Other Land,” which is a non-agricultural land use designation. Exhibit 3.2-1 depicts the Farmland Mapping and Monitoring Program mapping for the project vicinity.

Williamson Act Contracts

The project site does not support agricultural land use activities and therefore is not eligible for a Williamson Act contract.

Agricultural Zoning

The City of Orange Zoning Ordinance zones the project site “S-G (Sand and Gravel Extraction)” and “R-1-8 (Single-Family Residential 8,000 square-feet).” The S-G Zoning is a non-agricultural zoning district. The R-1-8 zoning allows agriculture/horticulture by-right, as well as tree and shrub farms through a conditional use permit.

3.2.2 - Regulatory Setting

State Regulations

California Land Conservation Act (Williamson Act)

The California Land Conservation Act of 1965 (Williamson Act) enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to maintain agricultural or related open space use. As an incentive, landowners receive lower property
tax assessments based on agricultural or open space land uses, as opposed to the real estate value of the land. No land within the City of Orange is currently under a Williamson Act contract.

**California Department of Conservation Classification**

The California Department of Conservation (CDC), Division of Land Resource Protection developed the Farmland Mapping and Monitoring Program (FMMP) in 1984 to analyze impacts to California’s agricultural resources. In the FMMP, land ratings are based on a land capability classification system, and land use. According to FMMP (2014), the project site has an agricultural land rating of “Other Land.”

**Public Resources Code**

The California Public Resource Codes Section 4562 defines Forest Land and Timber Land as follows:

*Forest Land*

Land that can support 10-percent native tree cover of any species, including: hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits.

*Timber Land*

Land, other than land owned by the federal government and land designated by the Board of Forestry and Fire Protection (Board) as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the Board on a District basis after consultation with the District committees and others.

**Local**

**City of Orange**

There are no City General Plan goals or policies that pertain to farmland and forest land.

**3.2.3 - Thresholds of Significance**

According to CEQA Guidelines Appendix G, to determine whether impacts to agriculture and forestry resources are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

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

b) Conflict with existing agricultural zoning, agricultural use or with land subject to a Williamson Act contract?

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Govt. Code section 51104(g))?
Exhibit 3.2-1
Land Use Classification Map

Source: CA Dept of Conservatoin, 2014
d) Result in the loss of forest land or conversion of forest land to non-forest use?

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

3.2.4 - Project Impacts and Mitigation Measures

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

Convert Farmland to Non-Agricultural Use

Impact AFR-1: The project would not convert Important Farmland to non-agricultural use.

**Impact Analysis**

Agricultural land use activities occurred on the project site as recently as 2004; however, the project site does not currently support agricultural activities. As shown in Exhibit 3.2-1, the project site is mapped as containing “Other Land” by the California Department of Conservation Farmland Mapping and Monitoring Program, which is a non-agricultural land use designation. Therefore, the development of the proposed project would not result in the conversion of Important Farmland to non-agricultural use. No impacts would occur.

**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 Existing Zoning or Williamson Act Contract

Impact AFR-2: The project would not conflict with existing agricultural zoning, agricultural use or with land subject to a Williamson Act contract.

**Impact Analysis**

The project site does not support agricultural land use activities and, therefore, is not eligible for a Williamson Act contract. The City of Orange Zoning Ordinance zones the project site “S-G (Sand and Gravel Extraction)” and “R-1-8 (Single-Family Residential 8,000 square-feet).” The S-G is a non-agricultural zoning district. The R-1-8 zoning allows agriculture/horticulture by-right, as well as tree and shrub farms through a conditional use permit. The proposed project would rezone the project site to Specific Plan (SP), which represent non-agricultural zoning. Thus, no conflicts with agricultural zoning would occur.
**Level of Significance Before Mitigation**
Less than significant impact.

**Mitigation Measures**
No mitigation is necessary.

**Level of Significance After Mitigation**
Less than significant impact.

**Forest Zoning**

| Impact AFR-3: | Forest: The project would not conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Govt. Code section 51104(g)). |

**Impact Analysis**
The project site is not currently zoned as forest land, timberland, or timberland zoned timberland production as defined by Public Resources Code sections 1220(g), 4526, or 51104(g). The project site is currently zoned for R-1-8 (Single-Family Residential) and S-G (Sand and Gravel Extraction). Therefore, the proposed project would not conflict with existing zoning for, or cause the rezoning of forest land, timberland, or timberland zoned timberland production. Thus, no impacts would occur as a result of the proposed project.

**Level of Significance Before Mitigation**
Less than significant impact.

**Mitigation Measures**
No mitigation is necessary.

**Level of Significance After Mitigation**
Less than significant impact.

**Loss or Conversion of Forest Land**

| Impact AFR-4: | The project would not result in the loss of forest land or conversion of forest land to non-forest use. |

**Impact Analysis**
The project site contains disturbed, undeveloped land that previously supported mining activities. There are 323 trees within the project site, of which the most common species are blue gum (eucalyptus), oak, willow, and palm. The trees within the project site do not meet Public Resources Code criteria for “timberland” because they are not commercial species used to produce lumber or other forest products. Additionally, they do not meet the Public Resource Code definition of “forest land” because they do not meet the minimum density requirements to be classified as forest land.
Thus, tree removal activities would not result in the conversion of timberland to non-timber use or forest land to non-forest use. No impacts would occur.

**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 Changes to Agricultural or Forest Land**

| Impact AFR-5: | Forest: The project would not involve other changes in the existing environment which, due to their location or nature, could result in conversion of agricultural land to non-agricultural use or forest land to non-forest use. |

**Impact Analysis**
Neither the project site nor surrounding land uses support agricultural land or timberland. This condition precludes the possibility of the proposed project creating pressures to convert farmland or timberland in the project vicinity to non-agricultural use. No impact would occur.

**Level of Significance Before Mitigation**
Less than significant impact.

**Mitigation Measures**
No mitigation is necessary.

**Level of Significance After Mitigation**
Less than significant impact.
3.3 - Air Quality

This section describes the existing air quality setting and potential effects from project implementation on the site and its surrounding area. FirstCarbon Solutions performed an air quality analysis for the proposed project, which is included in Appendix B.

3.3.1 - Environmental Setting

South Coast Air Basin

The project is located in the City of Orange and is within the South Coast Air Basin (SoCAB). The San Gabriel, San Bernardino, and San Jacinto Mountains bound the SoCAB on the north and east while the Pacific Ocean lies to the west of the SoCAB. The southern limit of the SoCAB is the San Diego County line. The SoCAB consists of Orange County, Los Angeles County (except for the Antelope Valley), the non-desert portion of western San Bernardino County, and the western and Coachella Valley portions of Riverside County.

Sensitive receptors represent the locations where potential project-related impacts are estimated and can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities can also be considered as sensitive receptors where individuals can be located for time periods of 24 hours or longer.

There are a number of existing residences near the project site. The closest existing residences are located to the east of the project site along River Birch Circle and Sycamore Glen Dr. The Salem Lutheran School is located approximately 600 feet to the south of the project across the East Santiago Canyon Rd. The shortest distances between existing sensitive receptors and the construction site ranges from 25 meters to 35 meters (82 to 115 feet).

Regional Climate

The regional climate factors such as the temperature, wind, humidity, precipitation, and amount of sunshine have a substantial influence on air quality in the SoCAB. The annual average temperatures throughout the SoCAB vary from the low to middle 60s (degrees Fahrenheit [°F]). Because of a decreased marine influence, the eastern portion of the SoCAB shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the SoCAB, with average minimum temperatures of 47°F in downtown Los Angeles and 36°F in San Bernardino. All portions of the SoCAB have recorded maximum temperatures above 100°F.

Although the climate of the SoCAB can be characterized as semi-arid, the air near the land surface is relatively humid on most days because of the presence of a marine layer from the Pacific Ocean. This shallow layer of sea air is an important modifier of SoCAB climate. Humidity restricts visibility in the SoCAB, and the conversion of sulfur dioxide to sulfates is heightened in air with high relative humidity. The marine layer provides an environment for that conversion process, especially during the spring and summer months. The annual average relative humidity within the SoCAB is 71 percent along the coast and 59 percent inland. Since the ocean effect is dominant, periods of heavy
early morning fog are frequent and low stratus clouds are a characteristic feature of the coastal areas. These effects decrease with distance from the coast.

More than 90 percent of the SoCAB’s rainfall occurs from November through April. The annual average rainfall varies from approximately 9 inches in Riverside to 14 inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thunderstorms near the coast and slightly heavier shower activity in the eastern portion of the SoCAB with frequency being higher near the coast.

Because of its generally clear weather, about three-quarters of available sunshine is received in the SoCAB. The remaining one-quarter is absorbed by clouds. The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are approximately 10 hours of possible sunshine, and on the longest day of the year there are approximately 14.5 hours of possible sunshine.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of the air pollutants. During the late autumn to early spring rainy season, the SoCAB is subjected to wind flows associated with the traveling storms moving through the region from the northwest. This period also brings five to ten periods of strong, dry offshore winds, locally termed “Santa Anas” each year. During the dry season, which coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes. Heavy, cool air descends the slopes and flows through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the SoCAB is the “Catalina Eddy,” a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island, which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

In the SoCAB, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing which effectively acts as an impervious lid to pollutants over the entire SoCAB. The mixing height for the inversion structure is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur primarily in the winter, when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. These inversions effectively trap pollutants, such as oxides of nitrogen (NOx) and carbon monoxide (CO) from vehicles, as the pool of cool air drifts seaward. Winter is therefore a period of high levels of primary pollutants along the coastline.
**Existing Local Air Quality**

Existing ambient air quality, historical trends, and future projections of air quality in the project area are best documented from measurements made near the project site. The South Coast Air Quality Management District (SCAQMD) maintains an extensive air-monitoring network that measures levels of several air pollutants throughout the SoCAB. Air quality in the SoCAB continues to improve over the long term, although the maximum concentration and number of days each year in which some standards are exceeded fluctuates from year to year due to weather conditions.

The SCAQMD has subdivided the SoCAB into 36 Source-Receptor Areas (SRAs), many containing one or more monitoring stations. These SRAs are designated to provide a general representation of the local meteorology, terrain, and air quality conditions within the particular geographical area. The project is located within the SRA 17 (Central Orange County). The nearest SCAQMD operated monitoring station to the project site where pollutant data are collected is the Pampas Lane Anaheim station in Anaheim, California, located about 7.5 miles east of the project site. Table 3.3-1 summarizes published monitoring data for the time period of 2014 through 2016, the most recent 3-year period available. The data show that during the past few years, the project area has exceeded the state and/or federal ambient air quality standards for ozone, particulate matter PM$_{10}$ and PM$_{2.5}$. The pollutant levels from SRA 17 were used to represent a “background” air quality for the project location.

**Table 3.3-1: Air Quality Monitoring Summary**

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<td>Ozone</td>
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<td>Max 1 Hour (ppm)</td>
<td>0.111</td>
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<td></td>
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<td>Days &gt; State Standard (0.09 ppm)</td>
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<td></td>
<td>8 Hour</td>
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<td>Days &gt; State Standard (0.07 ppm)</td>
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<td></td>
<td>Days &gt; National Standard (0.07 ppm)</td>
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<td>1</td>
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<td>Carbon monoxide</td>
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<td>Days &gt; State Standard (9.0 ppm)</td>
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<td></td>
<td>Days &gt; National Standard (9 ppm)</td>
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<td>Nitrogen dioxide</td>
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<td>1 Hour</td>
<td>Max 1 Hour (ppm)</td>
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<td>Days &gt; State Standard (0.18 ppm)</td>
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<td></td>
<td></td>
<td>98th Percentile</td>
<td>0.0598</td>
<td>0.0546</td>
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<td>Inhalable coarse particles</td>
<td>Annual</td>
<td>Annual Average (µg/m³)</td>
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<td>25.3</td>
<td>24.4</td>
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<tr>
<td>(PM$_{10}$)</td>
<td>24 hour</td>
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<td>Days &gt; State Standard (50 µg/m³)</td>
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<td>2</td>
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<td>Days &gt; National Standard (150 µg/m³)</td>
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Table 3.3-1 (cont.): Air Quality Monitoring Summary

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<td>Fine particulate matter (PM$_{2.5}$)</td>
<td>Annual</td>
<td>Annual Average ($\mu$g/m$^3$)</td>
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<td>14.8</td>
<td>9.4</td>
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<td></td>
<td>24 Hour</td>
<td>24 Hour ($\mu$g/m$^3$)</td>
<td>45.0</td>
<td>45.8</td>
<td>44.4</td>
</tr>
<tr>
<td></td>
<td>Days &gt; National Standard (35 $\mu$g/m$^3$)</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- ppm = parts per million
- $\mu$g/m$^3$ = micrograms per cubic meter
- max = maximum
- ID = insufficient data
- ND = no data
- National Standard = National Ambient Air Quality Standard
- Source: Air quality data from the Fontana Arrow monitoring station, and SCAQMD historical ambient air quality summaries.

The current attainment designations for the SoCAB are shown in Table 3.3-2. The SoCAB is designated as nonattainment for the state and/or federal ozone, PM$_{10}$, and PM$_{2.5}$ standards. The Los Angeles County portion of the SoCAB is in nonattainment for lead; however, the project area is in attainment for lead.

Table 3.3-2: South Coast Air Basin Attainment Status

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>State Status</th>
<th>National Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone</td>
<td>Nonattainment</td>
<td>Nonattainment—Extreme</td>
</tr>
<tr>
<td>Carbon monoxide</td>
<td>Attainment</td>
<td>Unclassified/Attainment</td>
</tr>
<tr>
<td>Nitrogen dioxide</td>
<td>Attainment</td>
<td>Unclassified/Attainment</td>
</tr>
<tr>
<td>Sulfur dioxide</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>Nonattainment</td>
<td>Attainment</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>Nonattainment</td>
<td>Nonattainment (Los Angeles County Only)</td>
</tr>
<tr>
<td>Lead</td>
<td>Attainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>Sulfates</td>
<td>Attainment</td>
<td>No national standard</td>
</tr>
<tr>
<td>Visibility Reducing Particles</td>
<td>Unclassified</td>
<td>No national standard</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>Unclassified</td>
<td>No national standard</td>
</tr>
</tbody>
</table>

Source of State status: ARB 2016b.

Toxic Air Contaminants

A toxic air contaminant, or TAC, is defined as an air pollutant which may cause or contribute to an increase in mortality or serious illness, or which 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 very low concentrations. For those TACs that may cause cancer, there is no concentration that does not present some risk. In other words, there is no threshold level 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. The majority of the estimated health risk from TACs can be attributed to a relatively few compounds, the most important being particulate matter (PM) from diesel-fueled engines, known as diesel particulate matter (DPM). In addition to DPM, benzene and 1,3 butadiene are also significant contributors to overall ambient public health risk in California.

The health risks can be defined in terms of the probability of developing cancer as a result of exposure to carcinogens at a given concentration. The Office of Environmental Health Hazard Assessment (OEHHA) Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA Guidance) recommends the incorporation of several factors to quantify the carcinogenic compound dose via the inhalation pathway which is the most important pathway for exposures to airborne TACs.

Some studies indicate that DPM poses the greatest health risk among the TACs listed above. A 10-year research program (ARB 1998) demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and 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.

DPM differs from other TACs in that it is not a single substance but a complex mixture of hundreds of substances. Although DPM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, however, no ambient monitoring data are available for DPM because no routine measurement method currently exists. The ARB has made preliminary concentration estimates based on a DPM exposure method. This method uses the ARB emissions inventory’s particulate matter less than 10 microns in diameter (PM$_{10}$) database, ambient PM$_{10}$ monitoring data, and the results from several studies to estimate concentrations of DPM.

**Odors**

Odors can cause a variety of responses. The impact of an odor results from interacting factors, such as frequency (how often), intensity (strength), duration (in time), offensiveness (unpleasantness), location, and sensory perception.

Odor is typically a warning system that prevents animals and humans from consuming spoiled food or toxic materials. Odor-related symptoms reported in a number of studies include nervousness,
headache, sleeplessness, fatigue, dizziness, nausea, loss of appetite, stomach ache, sinus congestion, eye irritation, nose irritation, runny nose, sore throat, cough, and asthma exacerbation (SCAQMD 2007b).

The SCAQMD’s role is to protect the public’s health from air pollution by overseeing and enforcing regulations. The SCAQMD’s resolution activity for odor compliance is mandated under California Health & Safety Code Section 41700, and falls under SCAQMD Rule 402. This rule on Public Nuisance Regulation states: “A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.”

The SCAQMD indicates that the number of overall complaints has declined over the last five years. Over the last four years, odor complaints make up 50 to 55 percent of the total nuisance complaints. Over the past decade, odors from paint and coating operations have decreased from 27 to 7 percent, and odors from refuse collection stations have increased from 9 to 34 percent.

Local Sources of Air Pollutants
The project site is largely vacant. Therefore, the only emissions from the current site would consist of fugitive windblown dust. The project site is surrounded by numerous residents within a radius of 0.5 mile. Emissions from the surrounding residences include the following: space and water heating, landscape maintenance, and motor vehicles.

3.3.2 - Regulatory Framework
Air Quality Regulations
Air pollutants are regulated at the national, state, and air basin level; each agency has a different level of regulatory responsibility. The EPA regulates at the national level. The ARB regulates at the state level and SCAQMD regulates at the air basin level.

Federal and State
The EPA handles global, international, 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 federal standards or national standards. There are national standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act of 1970. The criteria pollutants are:

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

The national standards were set to protect public health, including that of sensitive individuals; thus, the standards are periodically updated as more medical research is available regarding the health effects of the criteria pollutants. Primary national standards are the levels of air quality necessary, with an adequate margin of safety, to protect public health, as discussed in Table 3.3-3 below.

A State Implementation Plan (SIP) is a document prepared by each state describing existing air quality conditions and measures that will be followed to attain and maintain national 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. The ARB also administers California Ambient Air Quality Standards for the 10 air pollutants designated in the California Clean Air Act. The 10 state air pollutants are the six national standards listed above as well as the following: visibility-reducing particulates, hydrogen sulfide, sulfates, and vinyl chloride.

The national and state ambient air quality standards, the most relevant effects, the properties, and sources of the pollutants are summarized in Table 3.3-3.
### Table 3.3-3: Description of Air Pollutants

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Averaging Time</th>
<th>California Standard</th>
<th>Federal Standard</th>
<th>Most Relevant Effects from Pollutant Exposure</th>
<th>Properties</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ozone</strong></td>
<td>1 Hour</td>
<td>0.09 ppm</td>
<td>—</td>
<td>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.</td>
<td>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), and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.</td>
<td>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) are mobile sources (on-road and off-road vehicle exhaust).</td>
</tr>
<tr>
<td></td>
<td>8 Hour</td>
<td>0.070 ppm</td>
<td>0.075 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carbon monoxide (CO)</strong></td>
<td>1 Hour</td>
<td>20 ppm</td>
<td>35 ppm</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>8 Hour</td>
<td>9.0 ppm</td>
<td>9 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nitrogen dioxide (NO&lt;sub&gt;2&lt;/sub&gt;)</strong></td>
<td>1 Hour</td>
<td>0.18 ppm</td>
<td>0.100 ppm</td>
<td>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.</td>
<td>During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides—NO, NO&lt;sub&gt;2&lt;/sub&gt;, NO&lt;sub&gt;x&lt;/sub&gt;, N&lt;sub&gt;2&lt;/sub&gt;O, N&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;3&lt;/sub&gt;, N&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;5&lt;/sub&gt;, and N&lt;sub&gt;2&lt;/sub&gt;O&lt;sub&gt;9&lt;/sub&gt;. NO&lt;sub&gt;x&lt;/sub&gt; is a precursor to ozone, PM&lt;sub&gt;10&lt;/sub&gt;, and PM&lt;sub&gt;2.5&lt;/sub&gt; formation. NO&lt;sub&gt;x&lt;/sub&gt; can react with compounds to form nitric acid and related small particles and result in PM related health effects.</td>
<td>NO&lt;sub&gt;x&lt;/sub&gt; is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. Nitrogen dioxide forms quickly from NO&lt;sub&gt;x&lt;/sub&gt; emissions. NO&lt;sub&gt;2&lt;/sub&gt; concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations.</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>0.030 ppm</td>
<td>0.053 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Pollutant</td>
<td>Averaging Time</td>
<td>California Standard</td>
<td>Federal Standard*</td>
<td>Most Relevant Effects from Pollutant Exposure</td>
<td>Properties</td>
<td>Sources</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------</td>
<td>---------------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Sulfur dioxide (SO₂)</td>
<td>1 Hour</td>
<td>0.25 ppm</td>
<td>0.075 ppm</td>
<td>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.</td>
<td>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 (SOₓ) 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 PM₁₀.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>3 Hour</td>
<td>—</td>
<td>0.5 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 Hour</td>
<td>0.04 ppm</td>
<td>0.14 ppm (for certain areas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>—</td>
<td>0.030 ppm (for certain areas)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particulate matter (PM₁₀)</td>
<td>24 hour</td>
<td>50 µg/m³</td>
<td>150 µg/m³</td>
<td>• 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.</td>
<td>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. PM₁₀ refers to particulate matter that is between 2.5 and 10 microns in diameter, (one micron is one-billionth of a meter). PM₂.₅ refers to particulate matter that is 2.5 microns or less in diameter, about one-thirtieth the size of the average human hair.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Mean</td>
<td>20 µg/m³</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Particulate matter (PM₂.₅)</td>
<td>24 Hour</td>
<td>—</td>
<td>35 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>12 µg/m³</td>
<td>12.0 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Visibility reducing particles</td>
<td>8 Hour</td>
<td>See note below⁴</td>
<td>—</td>
<td>• Long-term exposure: reduced lung function; chronic bronchitis; changes in lung morphology; death.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*California Air Pollutant Time Standard; Federal Standard refers to the annual average.

⁴See note below.
<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Averaging Time</th>
<th>California Standard</th>
<th>Federal Standard</th>
<th>Most Relevant Effects from Pollutant Exposure</th>
<th>Properties</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfates</td>
<td>24 Hour</td>
<td>25 µg/m³</td>
<td>—</td>
<td>(a) Decrease in ventilatory function;</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Lead&lt;sup&gt;a&lt;/sup&gt;</td>
<td>30-day</td>
<td>1.5 µg/m³</td>
<td>—</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Quarter</td>
<td>—</td>
<td>1.5 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rolling 3-month average</td>
<td>—</td>
<td>0.15 µg/m³</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vinyl chloride&lt;sup&gt;b&lt;/sup&gt;</td>
<td>24 Hour</td>
<td>0.01 ppm</td>
<td>—</td>
<td>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.</td>
<td>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.</td>
<td>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.</td>
</tr>
</tbody>
</table>
Table 3.3-3 (cont.): Description of Air Pollutants

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Averaging Time</th>
<th>California Standard</th>
<th>Federal Standard</th>
<th>Most Relevant Effects from Pollutant Exposure</th>
<th>Properties</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen sulfide</td>
<td>1 Hour</td>
<td>0.03 ppm</td>
<td>—</td>
<td>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.</td>
<td>Hydrogen sulfide (H2S) is a flammable, colorless, poisonous gas that smells like rotten eggs.</td>
<td>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).</td>
</tr>
<tr>
<td>Volatile organic compounds (VOC)</td>
<td></td>
<td>There are no State or federal standards for VOCs because they are not classified as criteria pollutants.</td>
<td></td>
<td>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.</td>
<td>Reactive organic gases (ROGs), VOCs, are defined as any compound of carbon—including 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.</td>
<td>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.</td>
</tr>
<tr>
<td>Benzene</td>
<td></td>
<td></td>
<td></td>
<td>Short-term (acute) exposure of high doses from inhalation of benzene may cause dizziness, drowsiness, headaches, eye irritation, skin irritation, and respiratory tract irritation, and at higher levels, loss of consciousness can occur. Long-term (chronic) occupational exposure of high doses has caused blood disorders, leukemia, and lymphatic cancer.</td>
<td>Benzene is a VOC. It is a clear or colorless light-yellow, volatile, highly flammable liquid with a gasoline-like odor. The EPA has classified benzene as a “Group A” carcinogen.</td>
<td>Benzene is emitted into the air from fuel evaporation, motor vehicle exhaust, tobacco smoke, and from burning oil and coal. Benzene is used as a solvent for paints, inks, oils, waxes, plastic, and rubber. Benzene occurs naturally in gasoline at one to two percent by volume. The primary route of human exposure is through inhalation.</td>
</tr>
</tbody>
</table>
Table 3.3-3 (cont.): Description of Air Pollutants

<table>
<thead>
<tr>
<th>Air Pollutant</th>
<th>Averaging Time</th>
<th>California Standard</th>
<th>Federal Standarda</th>
<th>Most Relevant Effects from Pollutant Exposure</th>
<th>Properties</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel particulate matter (DPM)</td>
<td></td>
<td></td>
<td></td>
<td>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 cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>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 derivatives, and polycyclic aromatic hydrocarbons and their derivatives. Fifteen polycyclic aromatic hydrocarbons are confirmed carcinogens, a number of which are found in diesel exhaust.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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 various pieces of stationary construction equipment.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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 nonattainment 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. 

Federal Regulations

The EPA is responsible for setting and enforcing the National Ambient Air Quality Standards (NAAQS) for ozone (O₃), CO, nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM₁₀), and lead. The EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the ARB.

The Federal Clean Air Act (CAA) was first enacted in 1955, and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977 and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance. The CAA also mandates that states submit and implement SIPs for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants: O₃, NO₂, SO₂, PM₁₀, CO, PM₂.₅, and lead. The NAAQS were amended in July 1997 to include an additional standard for O₃ and to adopt a NAAQS for PM₂.₅.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and NOₓ. NOₓ is a collective term that includes all forms of nitrogen oxides (NO, NO₂, NO₃), which are emitted as byproducts of the combustion process.

State Regulations

California Air Resources Board (ARB)

The ARB, which became part of the California Environmental Protection Agency in 1991, is responsible for ensuring implementation of the California Clean Air Act (CAA) (Assembly Bill [AB] 2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. The California CAA mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The ARB established the California Ambient Air Quality Standards (CAAQS) for all pollutants for which the federal government has NAAQS and, in addition, established standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. However, at this time, hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the SoCAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS. Table 3.3-3 provides listing of the federal and state ambient air quality standards, relevant effects, properties, and sources of the pollutants. Several pollutants listed in Table 3.3-3 are not addressed in this analysis. Analysis of lead is not included in this report.
because the project is not anticipated to emit lead. Visibility-reducing particles are not explicitly addressed in this analysis because particulate matter is addressed. The project is not expected to generate or be exposed to vinyl chloride because project uses do not use the chemical processes that create this pollutant, and there are no such uses in the project vicinity. The project is not expected to cause exposure to hydrogen sulfide because it would not generate hydrogen sulfide in any substantial quantity.

The ARB has adopted a number of regulatory programs aimed at specifically reducing toxics air contaminant emissions. These programs include the following.

Diesel Risk Reduction Plan
In September 2000, the ARB adopted the Diesel Risk Reduction Plan (Diesel RRP or Plan), which recommends many control measures to reduce the risks associated with DPM and achieve a goal of 75 percent PM reduction by 2010 and 85 percent by 2020 (ARB 2000). The Plan involves the implementation of:

- New regulatory standards for on-road, off-road, and stationary diesel-fueled engines and vehicles
- New retrofit requirements for existing on-road, off-road, and stationary diesel-fueled engines and vehicles were determined to be technically feasible and cost-effective; and
- New Phase 2 diesel fuel regulations to reduce the sulfur content levels of diesel fuel to no more than 15 ppm to provide the quality of diesel fuel needed by the advanced diesel PM emission controls

The Plan set into motion a series of emission reduction regulations and control measures as discussed below.

Emission Reduction Funding
Carl Moyer Memorial Air Quality Standards Attainment Program. Since 1998, the Carl Moyer Memorial Air Quality Standards Attainment Program (Carl Moyer Program) has provided funding to encourage the voluntary purchase of cleaner engines, equipment, and emission reduction technologies. The Carl Moyer Program plays a complementary role to California’s regulatory program by funding emission reductions that are surplus, i.e., early and/or in excess of what is required by regulation. The Carl Moyer Program accelerates the turnover of old highly polluting engines, speeds the commercialization of advanced emission controls, and reduces air pollution impacts on environmental justice communities. Emission reductions achieved through the Carl Moyer Program are an important component of the California SIP.

Regulation for Construction-Related Equipment
Airborne Toxic Control Measure for Diesel Particulate Matter from Portable Engines Rated at 50 horsepower and Greater. The purpose of this measure is to reduce DPM emissions from portable diesel-fueled engines with a horsepower of 50 or greater. Each fleet is required to comply with weighted reduced particulate matter emission fleet averages by compliance dates listed in 17 California Code of Regulations Section 93116. Portable equipment includes but is not limited to, air
compressors, generators, concrete pumps, tub grinders, wood chippers, water pumps, drill rigs, pile drivers, rock drills, abrasive blasters, aggregate screening and crushing plants, concrete batch plants, and welders.

**ARB Regulation for In-Use Off-Road Diesel Vehicles (Off-Road Regulation), Title 13, Article 4.8, Chapter 9, Section 2449 in the California Code of Regulations.** On July 26, 2007, the ARB adopted a regulation to reduce particulate matter and NOx emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. All self-propelled off-road diesel vehicles over 25 horsepower (hp) used in California and most two-engine vehicles (except on-road two-engine sweepers) are subject to this regulation. This includes vehicles that are rented or leased (rental or leased fleets). Such vehicles are used in construction, mining, and industrial operations. The Off-Road regulation:

- Imposes limits on idling (no more than five consecutive minutes) and requires a written idling policy;
- Requires a disclosure when selling vehicles;
- Requires all vehicles to be reported to ARB (using the Diesel Off-Road Online Reporting System, DOORS) and labeled;
- Restricts adding older equipment into fleets; and
- Requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (i.e., exhaust retrofits).

**Regulations for Heavy-Duty Vehicles/Trucks**

**ARB Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling**

ARB adopts new section 2485 within Chapter 10, Article 1, Division 3, title 13 in the California Code of Regulations. The measure limits the idling of diesel vehicles (i.e., commercial trucks over 10,000 pounds) to reduce emissions of toxics and criteria pollutants. The driver of any vehicle subject to this section: (1) shall not idle the vehicle’s primary diesel engine for greater than five minutes at any location; and (2) shall not idle a diesel-fueled auxiliary power system for more than five minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

**ARB Requirements to Reduce Idling Emissions from New and In-Use Trucks.** Amendments were made to Title 13 in California Code of Regulations in Sections 1956.8, 2404, 2424, 2425, and 2485. The amendment states: “all new 2008 and subsequent model-year heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to ‘neutral’ or ‘park,’ and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to ‘neutral’ or ‘park.’” There are a few conditions where the engine shutdown system can be overridden to prevent engine damage. Any project trucks manufactured after 2008 would be consistent with this rule, which would ultimately reduce air emissions.
Statewide Truck and Bus Regulation (Regulation to Reduce Emissions of DPM, Oxides of Nitrogen and Other Criteria Pollutants, from In-Use Heavy-Duty Diesel-Fueled Vehicles, Title 13, California Code of Regulations, Section 2025). On December 12, 2008, the ARB approved this regulation to reduce emissions from existing on-road diesel trucks and buses operating in California. This regulation applies to all on-road heavy-duty diesel-fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds, agricultural yard trucks with off-road certified engines, and certain diesel fueled shuttle vehicles of any gross vehicle weight rating. Out-of-state trucks and buses that operate in California are also subject. Under the regulation, older, heavier trucks (i.e. those with pre-2000 year engines and a gross vehicle weight rating greater than 26,000 pounds), are required to have installed a particulate matter filter and must be replaced with a 2010 engine between 2015 and 2020, depending on the model year. By 2015, all heavier pre-1994 trucks must be upgraded to 2010 engines and newer trucks are thereafter required to be replaced over the next eight years. Older, more polluting trucks are required to be replaced first, while trucks that already have relatively clean 2007-2009 engines are not required to be replaced until 2023. Lighter trucks (14,001-26,000 pounds) must adhere to a similar schedule. Furthermore, nearly all trucks that are not required under the Truck and Bus Regulation to be replaced by 2015 are required to be upgraded with a particulate matter filter by that date.

California Health and Safety Code Section 42301.6 to 42301.9
This state code section addresses sources of hazardous air pollutants near schools. It requires new or modified sources of hazardous air emissions located within 1,000 feet from the outer boundary of a school to give public notice to the parents or guardians of children enrolled in any school located within one-quarter mile of the source and to each address within a 1,000 foot radius.

Regional Regulations
South Coast Air Quality Management District
Local air quality management districts such as the SCAQMD regulate air emissions from stationary and area-wide sources of emissions and to limited extent from mobile sources. All air pollution control districts have been formally designated attainment or non-attainment for each CAAQS. The project is located within the SCAQMD and, therefore, is subject to its rules and regulations.

Serious non-attainment areas are required to prepare air quality management plans that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources.
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development).
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions.
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled.
• Significant use of low emissions vehicles by fleet operators.

• Sufficient control strategies to achieve a five percent or more annual reduction in emissions or 15 percent or more in a period of three years for ROGs, NOx, CO and PM$_{10}$. However, air basins may use alternative emission reduction strategy that achieves a reduction of less than five percent per year under certain circumstances.

**2016 AQMP**

On March 3, 2017, the SCAQMD adopted the 2016 AQMP. The 2016 AQMP address strategies and measures to attain the 2008 federal 8-hour ozone standard by 2032, the 2012 federal annual PM$_{2.5}$ standard by 2021 to 2025, and the 2006 federal 24-hour PM$_{2.5}$ standard by 2019. The 2016 AQMP also examined the regulatory requirements for attaining the 2015 federal 8-hour ozone standard. The 2016 AQMP also updates previous attainment plans for ozone and PM$_{2.5}$ that have not yet been met (SCAQMD 2016). In general, the AQMP is updated every 3 to 4 years. However, the air quality planning process for the AQMP is continuous and each iteration is an update of the previous plan.

To ensure air quality goals will be met while minimizing impacts to the regional economy, the following policy objectives guided the development of the plan:

• Eliminate reliance on “black box” (future technologies) to the maximum extent possible by providing specific pathways to attainment with specific control measures.

• Calculate and take credit for co-benefits from other planning efforts (e.g., GHG reduction targets, energy efficiency, transportation).

• Develop a strategy with fair-share emission reductions at the federal, state, & local levels such as a new federal engine emission standards and/or additional authority provided to the state or SCAQMD for mobile sources.

• Seek significant funding for incentives to implement early deployment and commercialization of known zero and near-zero technologies.

• Invest in strategies and technologies meeting multiple objectives regarding air quality, climate change, air toxic exposure, energy, and transportation.

• Enhance the socioeconomic analysis and select the most efficient and cost-effective path to achieve multi-pollutant and multi-deadline targets.

• Prioritize non-regulatory, innovative and “win-win” approaches for emission reductions.

The 2016 AQMP also demonstrates attainment of the 2008 Ozone Standard in Coachella Valley by 2026. The Plan also demonstrates compliance with all applicable Federal Clean Air Act requirements pertaining to nonattainment areas pursuant to the EPA approved Implementation Rules, such as the annual average and summer planning emission inventory for criteria and precursor pollutants, attainment demonstrations, reasonably available control measure and reasonably available control technology analyses, reasonable further progress, particulate matter precursor requirements, vehicle miles traveled (VMT) demonstrations, and transportation conformity budgets for SoCAB and Coachella Valley.
The control measures in the 2016 AQMP are based on implementing all feasible control measures through the accelerated deployment of available cleaner technologies, best management practices, co-benefits from existing programs, and incentive measures. The 2016 AQMP control measures consist of three main components: (1) the SCAQMD’s Stationary and Mobile Source Control Measures; (2) suggested state and federal Source Control Measures; and (3) Regional Transportation Plan Transportation Control Measures provided by Southern California Association of Governments. These measures rely on not only the traditional command-and-control approach, but also public incentive programs, as well as advanced technologies expected to be developed and deployed in the next several years.

**Air Quality Management Plans**

An Air Quality Management Plan (AQMP) is a plan prepared and implemented by an air pollution district for a county or region designated nonattainment for the federal and/or California ambient air quality standards. The term nonattainment area is used to refer to an area where one or more ambient air quality standards are exceeded. The AQMPs prepared by the various air districts within the State are then assembled to form the SIP.

**South Coast Air Quality Management District Rules**

The AQMP for the air basin establishes a program of rules and regulations administered by SCAQMD necessary to attain the state and national air quality standards. The rules and regulations that apply to this project include, but are not limited to, the following:

**SCAQMD Rule 402**

Prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

**SCAQMD Rule 403**

Governs emissions of fugitive dust during construction and operation activities. Compliance with this rule is achieved through application of standard Best Management Practices, such as application of water or chemical stabilizers to disturbed soils, covering haul vehicles, restricting vehicle speeds on unpaved roads to 15 miles per hour, sweeping loose dirt from paved site access roadways, cessation of construction activity when winds exceed 25 miles per hour (mph), and establishing a permanent ground cover on finished sites.

**SCAQMD Rule 481**

Applies to all spray painting and spray coating operations and equipment. This rule would apply to the application of architectural coatings to the exterior and interior of the building walls. The rule states that a person shall not use or operate any spray painting or spray coating equipment unless one of the following conditions is met:

1. The spray coating equipment is operated inside a control enclosure, which is approved by the Executive Officer. Any control enclosure for which an application for permit for new
construction, alteration, or change of ownership or location is submitted after the date of adoption of this rule shall be exhausted only through filters at a design face velocity not less than 100 feet per minute nor greater than 300 feet per minute, or through a water wash system designed to be equally effective for the purpose of air pollution control.

(2) Coatings are applied with high-volume low-pressure, electrostatic and/or airless spray equipment.

(3) An alternative method of coating application or control is used which has effectiveness equal to or greater than the equipment specified in the rule.

SCAQMD Rule 1108
Governs the sale, use, and manufacturing of asphalt and limits the VOC content in asphalt used in the SoCAB. This rule would regulate the VOC content of asphalt used during construction. Therefore, all asphalt used during construction of the project must comply with SCAQMD Rule 1108.

SCAQMD Rule 1113
Governs the sale, use, and manufacturing of architectural coating and limits the VOC content in paints and paint solvents. This rule regulates the VOC content of paints available during construction. Therefore, all paints and solvents used during construction and operation of the project must comply with SCAQMD Rule 1113.

SCAQMD Rule 1143
Governs the manufacture, sale, and use of paint thinners and solvents used in thinning of coating materials, cleaning of coating application equipment, and other solvent cleaning operations by limiting their VOC content. This rule regulates the VOC content of solvents used during construction. Solvents used during the construction phase must comply with this rule.

SCAQMD Rule 1186
Limits the presence of fugitive dust on paved and unpaved roads and sets certification protocols and requirements for street sweepers that are under contract to provide sweeping services to any federal, state, county, agency or special district such as water, air, sanitation, transit, or school district.

SCAQMD Rule 1303
Governs the permitting of re-located or new major emission sources, requiring Best Available Control Measures and setting significance limits for PM10 among other pollutants.

SCAQMD Rule 220
Sets forth “On-Road Motor Vehicle Mitigation Options”; provides employers with a menu of options to reduce mobile source emissions generated from employee commutes, to comply with federal and state Clean Air Act requirements, Health & Safety Code Section 40458, and Section 182(d)(1)(B) of the federal Clean Air Act. It applies to any employer who employs 250 or more employees on a full or part-time basis at a worksite for a consecutive six-month period, calculated as a monthly average.
Local

City of Orange

General Plan

The City of Orange General Plan contains the following goals, policies, and actions that address air quality and are applicable to the proposed project:

Natural Resources Element

- **Goal 2.0**: Protect air, water and energy resources from pollution and overuse.
- **Policy 2.1**: Cooperate with the SCAQMD and other regional agencies to implement and enforce regional air quality management plans.
- **Policy 2.2**: Support alternative transportation modes, alternative technologies and bicycle- and pedestrian-friendly neighborhoods to reduce emissions related to vehicular travel.
- **Policy 2.6**: Encourage sustainable building and site designs for new construction and renovation projects.

3.3.3 - Thresholds of Significance

According to the California Environmental Quality Act (CEQA) Guidelines’ Appendix G Environmental Checklist, the following questions are analyzed and evaluated to determine whether impacts to air quality are significant environmental effects:

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?

This analysis will follow the guidance in the CEQA Guideline Amendments.

To assist in the establishment of a quantitative determination of what is considered “significant,” the SCAQMD has published a number of significance thresholds that apply to new projects constructed or operated within the SCAQMD. The SCAQMD recommends that lead agencies apply these thresholds in determining whether a proposed project would result in a significant air quality impact. If the lead agency finds that a proposed project has the potential to exceed these air pollution thresholds, the project would be considered significant. These thresholds have been defined by
SCAQMD for the SoCAB, based on scientific data the SCAQMD has obtained and factual data within the federal and state Clean Air Acts. Since the project is located within the SoCAB, these thresholds are applicable to this project. The SCAQMD has defined thresholds for oxides of nitrogen (NO$_x$), volatile organic carbon (VOC), oxides of sulfur (SO$_x$), CO, PM$_{10}$, and PM$_{2.5}$, hereinafter referred to as “criteria” pollutants, and for health risk in terms of cancer and non-cancer risk.

From the perspective of this analysis, four types of significance thresholds were evaluated in terms of impacts on air quality from the construction and operation of the project. These thresholds are the Regional Significance Thresholds, Local Significance Thresholds (LSTs), Health Risk Significance Thresholds, and CO “Hot Spot” Thresholds, which are discussed below.

**Regional Air Quality Significance Thresholds**

The regional thresholds apply to all aspects of the project including construction and operations. The mass emission-based regional thresholds were established because a project’s emissions could potentially contribute to the basin’s regional emission burden and affect air quality many miles away from a project location. The SCAQMD recommends regional significance thresholds for VOC, NO$_x$, SO$_x$, carbon monoxide (CO), and particulate matter (PM$_{10}$ and PM$_{2.5}$). Any construction or operational-related emissions from the project in excess of any of the thresholds presented in Table 3.3-4 would be considered to result in a significant impact.

**Table 3.3-4: SCAQMD Regional Significance Thresholds**

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Construction (lbs/day)</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO$_x$</td>
<td>100</td>
<td>55</td>
</tr>
<tr>
<td>VOC</td>
<td>75</td>
<td>55</td>
</tr>
<tr>
<td>PM$_{10}$</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>PM$_{2.5}$</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>SO$_x$</td>
<td>150</td>
<td>150</td>
</tr>
<tr>
<td>CO</td>
<td>550</td>
<td>550</td>
</tr>
</tbody>
</table>

Notes:
From SCAQMD CEQA Handbook (SCAQMD, 1993.)
NO$_x$ = nitrogen oxides
VOC = Volatile Organic Compounds
CO = carbon monoxide
PM$_{10}$ = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less;
PM$_{2.5}$ = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers

**Local Air Quality Significance Thresholds (LSTs)**

LSTs were developed in response to the SCAQMD Governing Board’s environmental justice (EJ) initiatives (EJ initiative 1–4) in recognition of the fact that criteria pollutants such as CO, NO$_x$, and PM$_{10}$ and PM$_{2.5}$ in particular, can have local impacts as well as regional impacts. The goal of
significance thresholds is to ensure that no source creates, or receptor endures, a significant adverse impact from any project. The evaluation of localized air quality impacts determines the potential to cause or contribute to an existing or new air quality violation, or expose sensitive receptors to substantial pollutant concentrations. LSTs represent the maximum emissions or air concentrations from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or State ambient air quality standard, at any nearby sensitive or worker receptor. LSTs are defined separately for construction and operational activities and are dependent upon location, project size, and distance to the sensitive receptor.

The SCAQMD created a series of lookup tables that present the maximum emission (e.g., the localized significance thresholds) that a project can emit without contributing to an existing or new air quality standard exceedance. The value of the LST depends on the project location, size of the project area, and distance to the nearest sensitive receptor. The project is located within SRA 17 (Central Orange County). Therefore, the LSTs for this SRA location were selected for the LST assessment.

Construction
During construction, the project size is generally represented as the maximum area disturbed during a day from which emissions are calculated. Based on the level of various activities during construction, the largest amount of area to be disturbed is expected to occur during grading of the project site. The emission lookup tables are used to identify the relevant construction LSTs.

Operations
During operational-activities, the project would generate on-site emissions including area sources and energy sources. Area sources would include activities such as landscape maintenance and occasional architectural coatings. Energy sources would include electricity and natural gas combustion for space and water heating. The emission lookup tables are used to identify the relevant operation LSTs. Because a majority of the project’s mobile-source emissions would occur on the local and regional roadway network away from the project, only the on-site area-, energy-, and mobile-source emissions were included in this analysis. A trip length of 0.5 mile was used in the modeling input assumptions to account for on-site emissions from mobile sources.

A significant impact would occur if a project’s construction or operational-related impacts exceed any of the LSTs.

Health Risk Significance Thresholds
In addition to the LSTs established above for criteria pollutants, the SCAQMD has also defined health risk significance thresholds. 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 lifetime period of several years. The principal TAC emission analyzed in this assessment was the emissions of diesel particulate matter (DPM) from the operation of off-road equipment and diesel-powered delivery and worker vehicles during construction. The derivation of the emissions from these sources and the assumptions used to estimate cancer risks are provided in Appendix B in this EIR.
As a point of reference, an individual located in an area with a cancer risk of 10 in one million would experience ten chances out of a population of one million of contracting cancer over lifetime period, assuming that individual lives in that area continuously for the entire time period. The SCQMD recommends assessing cancer risks over a lifetime of 30 years. For purposes of this health risk assessment, the potential health risks resulting from project construction emissions were estimated over the two-years of construction.

TACs can also cause chronic (long-term) and acute (short-term) related non-cancer illnesses such as reproductive effects, respiratory effects, eye sensitivity, immune effects, kidney effects, blood effects, central nervous system effects, birth defects, or other adverse environmental effects. 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 Reference Exposure Level (REL).

The SCQMD has established the following health risks thresholds:

**Project-Specific Health Risk Significance Thresholds**

The SCQMD has established the following project-specific health risk significance thresholds:

- Maximum Incremental Cancer Risk $\geq 10$ in 1 million
- Hazard Index (project increment) $\geq 1.0$

A significant impact would occur if a project’s impacts exceeded any of these thresholds.

**Estimation of Cancer Risks**

The Office of Environmental Health Hazard Assessment (OEHHA) has developed Risk Assessment Guidelines for estimating cancer risks that provide adjustment factors that emphasize the increased sensitivities and susceptibility of human to exposures to TACs. The recommended method for the estimation of cancer risk is shown in the equations below for the duration of the construction time period (2 years),

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

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.

$C_{\text{DPM}} =$ 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:

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

Where:

- \(\text{CPF}\) = Inhalation cancer potency factor for the TAC: \(1.1 \text{ (mg/kg-day)}^{-1}\) for DPM
- \(\text{EF}\) = Exposure frequency: 350 (days/year)
- \(\text{ED}\) = Exposure duration (2 years of construction)
- \(\text{AT}\) = Averaging time period over which exposure is averaged (days)
- \(\text{AAF}\) = set of age-specific adjustment factors that include age sensitivity factors (ASF), daily breathing rates (DBR), and time at home factors (TAH)

The OEHHA recommended values for the various cancer risk parameters shown in the Equation 2 are shown in Table 3.3-5. Note, however, the SCAQMD has not officially adopted the updated OEHHA guidance for CEQA evaluations. However, the SCAQMD provides recommended values for the various cancer risk parameters as part of its procedures for demonstrating compliance with SCAQMD Rules 1401 and 212 that are also shown in Table 3.3-5.

**Table 3.3-5: Exposure Assumptions for Cancer Risk—Updated OEHHA Guidance**

<table>
<thead>
<tr>
<th>Receptor Type</th>
<th>Exposure Frequency</th>
<th>Construction Exposure Duration (years)</th>
<th>Age Sensitivity Factors (ASF)</th>
<th>Time at Home Factor (TAH)(^{(1)}) (%)</th>
<th>Daily Breathing Rate(^{(2)}) (DBR) (L/kg-day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitive/Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Trimester</td>
<td>24</td>
<td>350</td>
<td>0.25</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>0–2 years</td>
<td>24</td>
<td>350</td>
<td>2</td>
<td>10</td>
<td>100</td>
</tr>
<tr>
<td>3–16 years</td>
<td>24</td>
<td>350</td>
<td>2</td>
<td>3</td>
<td>72</td>
</tr>
<tr>
<td>&gt;16–30 years</td>
<td>24</td>
<td>350</td>
<td>2</td>
<td>1</td>
<td>73</td>
</tr>
</tbody>
</table>

Notes:

\(^{(1)}\) Time at Home (TAH) factors recommended by the SCAQMD
\(^{(2)}\) The daily breathing rates recommended by the SCAQMD are the 95th percentile rate for sensitive/residential receptors 0 to 2 years

(L/kg-day) = liters per kilogram body weight per day

Source of Current OEHHA Guidance: OEHHA 2015 and SCAQMD 2015b

Source: Appendix B

The project site is surrounded by residences, and the closest sensitive receptor is located at 25 meters (82 feet) to the east of the project, at the corner along River Birch Circle. The Salem Lutheran School is located approximately 600 feet to the south of the project across the East Santiago Canyon Rd. The exposure frequency of the school students is 180 days, the age sensitive factor is 3, and the daily breathing rate is 520 liters/kg-day. All these parameters are lower than the parameters’ listed in Table 3.3-5. The inhalation exposure factor for students is lower than the factors for children at
year 1-2. Therefore, the cancer risks assumptions shown in Table 3.3-5 is the most conservative assumptions. If the cancer risks estimated based on assumptions above do not exceed the SCAQMD’s maximum incremental cancer risk, the project would not result in significant impact on human health cancer risks.

**Estimation of Non-Cancer 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). To calculate the hazard index, each chemical concentration or dose is divided by the appropriate toxicity reference exposure level. 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.

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

\[ HI = \frac{C_{ann}}{REL} \]  

(EQ-3)

Where:

- \( HI \) = chronic hazard index
- \( C_{ann} \) = annual average concentration of TAC as derived from the air dispersion model (µg/m³)
- \( REL \) = reference exposure level above which a significant impact is assumed to occur (µg/m³)

For purposes of this assessment, the TAC of concern is DPM for which the OEHHA has defined a chronic non-cancer REL for DPM of 5 µg/m³. The principal toxicological endpoint assumed in this assessment was through inhalation.

**Cumulative Health Risk Significance Thresholds**

The AQMD has published a report on how to address cumulative impacts from air pollution: White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution.\(^2\) In this report, the AQMD clearly states (page D-3):

The AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. The project specific (project increment) significance threshold is \( HI > 1.0 \) while the cumulative (facility-wide) is \( HI > 3.0 \). It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same

significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.

Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant.

**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 SCAQMD for preparing air dispersion assessments. Specifically, the AERMOD model was used to estimate levels of air emissions at sensitive receptor locations from the project’s construction PM₁₀ exhaust 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, construction area, and a representative construction schedule.

Three emission sources were used to represent the project’s DPM construction emissions. One source represented the generation of on-site construction DPM emissions (as PM₁₀ exhaust) from the off-road construction equipment, while the other two sources were used to represent the project’s off-site construction DPM emissions generated by construction vehicles. The emissions from the on-site source were represented in the AERMOD model as an area source, while the emissions from the two off-site sources were represented in the AERMOD as line volume sources. Construction vehicles were assumed to travel to the project site along East Santiago Canyon Rd to the east toward CA State Route 241 (50%), and the other 50% vehicles travel along East Santiago Canyon Rd to the west. The percentage of trips in each direction was estimated based on traffic impact analysis for operational vehicle trip distribution. Construction was assumed to take place on an 8-hour-per-day/5-day-per-week basis for the years 2019 and 2020.

Receptor locations within the AERMOD model were placed at locations of existing residences surrounding the project. The air dispersion model assessment used meteorological data from the SCAQMD John Wayne International Airport monitoring station for the years 2012–2016. All the receptors were placed within the breathing zone at zero meters above ground level.³

**Carbon Monoxide “Hot Spot” Thresholds**

The largest contributor of CO emissions during project operations is typically from motor vehicles. A CO hotspot represents a condition wherein high concentrations of CO may be produced by motor vehicles accessing a congested traffic intersection under heavy traffic volume conditions. The CO hotspot thresholds are represented by the most restricted state or federal CO ambient air quality standards:

• 1-hour CO standard: 20 ppm (state), 35 ppm (federal); and
• 8-hour CO standard: 9 ppm (state/federal).

If the CO contributed by the project in combination with CO produced by non-project traffic exceeds the above standards, then the project would have a significant impact.

3.3.4 - 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

<table>
<thead>
<tr>
<th>Impact AIR-1:</th>
<th>The project may conflict with or obstruct implementation of the applicable air quality plan.</th>
</tr>
</thead>
</table>

Impact Analysis

To evaluate whether or not a project conflicts with, or obstructs the implementation of the applicable air quality plan (2017 AQMP for the South Coast Air Basin), the SCAQMD CEQA Air Quality Handbook states that there are two key indicators. These indicators are identified and discussed below.

1. Indicator: Whether the project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

2. Indicator: According to Chapter 12 of the SCAQMD CEQA Air Quality Handbook, the purpose of the General Plan consistency findings is to determine whether a project is inconsistent with the growth assumptions incorporated into the air quality plan, and thus, whether it would interfere with the region’s ability to comply with federal and California air quality standards.

Considering the recommended criteria in the CEQA Handbook, this analysis uses the following criteria to address this potential impact:

• Criterion 1: Project’s contribution to air quality violations (SCAQMD’s first indicator);
• Criterion 2: Assumptions in AQMP (SCAQMP’s second indicator); and
• Criterion 3: Compliance with applicable emission control measures in the AQMPs.

Criterion 1: Project’s Construction to Air Quality Violations

According to the SCAQMD, the project is consistent with the AQMP if the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP.

As discussed in Impact AIR-2, construction-related activities would result in emissions of NOx that exceed SCAQMD’s significance thresholds on a daily basis prior to the application of mitigation. The operation of the project as discussed in Impact AIR-2 would not exceed the SCAQMD’s operational
significance thresholds. Therefore, the project would result in a potentially significant impact during construction under Criteria 1.

**Criterion 2: Assumptions in AQMP**

According to Chapter 12 of the SCAQMD CEQA Air Quality Handbook, the purpose of the General Plan consistency finding is to determine whether a project is inconsistent with the growth assumptions incorporated into the air quality plan and thus, whether it would interfere with the region’s ability to comply with federal and California air quality standards.

The City of Orange designates the project site “Low Density Residential,” “Resource Area” and “Open Space.” The City of Orange Zoning Ordinance zones the project site “S-G (Sand and Gravel Extraction)” and “R-1-8 (Single-Family Residential 8,000 square-feet).”

The proposed project involves the development of up to 129 dwelling units on 40 acres within the area designated “Resource Area” and the preservation of the remaining 69 acres (which overlap with the “Resource Area” and “Low Density Residential” designations) as open space and recreation uses. Accordingly, the applicant is proposing to change the “Resource Area” designation to a combination of “Low Density Residential,” and “Open Space,” and the “Low Density Residential” designation to “Open Space.” Therefore, the project is consistent with the General Plan land use designations.

The development of the Air Quality Management Plan (AQMP) is based in part on the land use general plan determinations of the various cities and counties that constitute the SoCAB. A project that is consistent with the general plan is considered to be accounted for in the AQMP.

Therefore, the project would not adversely affect growth assumptions within the AQMP. The project would be less than significant under Criteria 2.

**Criterion 3: Control Measures**

The proposed project would comply with all applicable rules and regulations of the AQMP. Because of the nature of the proposed project, which includes earthmoving activity, SCAQMD Rule 403 applies. Rule 403 governs emissions of fugitive dust during construction and operation activities. The rule requires that fugitive dust be controlled with best available control measures so that the presence of such dust does not remain visible in the atmosphere beyond the property line of the emission source. In addition, SCAQMD Rule 403 requires implementation of dust suppression techniques to prevent fugitive dust from creating a nuisance off-site. Compliance with this rule is achieved through application of standard Best Management Practices (BMPs). These BMPs include application of water or chemical stabilizers to disturbed soils; covering haul vehicles; restricting vehicle speeds on unpaved roads to 15 miles per hour; sweeping loose dirt from paved site access roadways; cessation of construction activity when winds exceed 25 miles per hour; and establishing a permanent ground cover on finished sites. The project’s compliance with SCAQMD Rule 403 would result in consistency with the applicable AQMP control measures. As such, emissions from fugitive dust during construction would be reduced to less than significant levels.

Therefore, the project would comply with the required control measures and therefore, the impact would be less than significant under Criteria 3.
As discussed in Impact AIR-2, the maximum daily construction emissions after the implantation of Mitigation Measures AIR-1a through AIR-1g do not exceed the SCAQMD’s regional significance thresholds. Therefore, the impact would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM AIR-1a** During construction, all equipment shall be maintained in good operating condition so as to reduce emissions. The construction contractor shall ensure that all construction equipment is properly serviced and maintained in accordance with the manufacturer’s specifications. Maintenance records shall be available at the construction site for City verification.

**MM AIR-1b** The following volatile organic compound (VOC) control measures shall be implemented during architectural coating activities:

a) Use paints with a volatile organic compound (VOC) content of no more than 100 grams per liter for both interior and exterior coatings.

b) Keep lids closed on all paint containers when not in use to prevent VOC emissions and excessive odors.

c) Use compliant low VOC cleaning solvents to clean paint application equipment.

d) Keep all paint and solvent laden rags in sealed containers to prevent VOC emissions.

**MM AIR-1c** Prior to the issuance of grading permits for the project, the project applicant shall include a dust control plan as part of the construction contract standard specifications. The dust control plan shall include measures to meet the requirements of SCAQMD Rules 402 and 403. Such basic measures may include but are not limited to the following:

a) All haul trucks shall be covered prior to leaving the site to prevent dust from impacting the surrounding areas.

b) Moisten soil each day prior to commencing grading to depth of soil cut.

c) Water exposed surfaces at least three times a day under calm conditions, and as often as needed on windy days or during very dry weather in order to maintain a surface crust and minimize the release of visible emissions from the construction site.

d) Treat any area that will be exposed for extended periods with a soil conditioner to stabilize soil or temporarily plant with vegetation.

e) Use street sweepers that comply with SCAQMD Rules 1186 and 1186.1.

f) All contractors shall turn off all construction equipment and delivery vehicles when not in use, or limit on-site idling to no more than 5 minutes in any one hour.
g) On-site electrical hook ups to a power grid shall be provided for electric construction tools including saws, drills, and compressors, where feasible, to reduce the need for diesel powered electric generators.

h) Traffic speeds on all unpaved roads to be reduced to 15 miles per hour or less.

i) Sweep streets at the end of the day if visible soil is carried onto adjacent public paved roads.

**MM AIR-1d** Prior to and during grading activities, the project applicant shall comply with South Coast Air Quality Management District Rule 403 as follows:

- The applicant shall submit a fully executed Large Operation Notification (Form 403 N) to the SCQAMD Executive Officer within 7 days of qualifying as a large operation. The form shall include the name(s), address(es), and phone number(s) of the person(s) responsible for the submittal, and a description of the operation(s), including a map depicting the location of the site.
- Maintain daily records to document the specific dust control actions taken, maintain such records for a period of not less than three years; and make such records available to the Executive Officer upon request.
- Install and maintain project signage with project contact signage that meets the minimum standards of the Rule 403 Implementation Handbook, prior to initiating any earthmoving activities.
- Identify a dust control supervisor that (1) is employed by or contracted with the property owner or developer; (2) is on the site or available on-site within 30 minutes during working hours; (3) has the authority to expeditiously employ sufficient dust mitigation measures to ensure compliance with all Rule requirements; (4) has completed the AQMD Fugitive Dust Control Class and has been issued a valid Certificate of Completion for the class; and (5) will notify the Executive Officer in writing within 30 days after the site no longer qualifies as a large operation.

**MM AIR-1e** Prior to and during grading activities, the project applicant shall implement the following dust control measures for large operations, as applicable, pursuant to South Coast Air Quality Management District Rule 403:

**Earth Moving (except construction cutting and filling areas, and mining operations)**

1a. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; or

1a-1. For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth Moving—Construction Fill Areas

1b. Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the Executive Officer, the California Air Resources Board, and the U.S. EPA. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the Executive Officer and the California Air Resources Board and the U.S. EPA, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

Earth Moving—Construction Cut Areas and Mining Operations

1c. Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.

Disturbed Surface Areas—Completed Grading Areas

2a/b. Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.

2c. Apply chemical stabilizers within five working days of grading completion; OR

2d. Take actions (3a) or (3c) specified for inactive disturbed surface areas.

Inactive Disturbed Surface Areas

3a. Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; or

3b. Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; or

3c. Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR

3d. Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.
Unpaved Roads

4a. Water all roads used for any vehicular traffic at least once per every two hours of active operations [3 times per normal 8 hour work day]; or
4b. Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; or
4c. Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.

Open Storage Piles

5a. Apply chemical stabilizers; or
5b. Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; or
5c. Install temporary coverings; or
5d. Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile. This option may only be used at aggregate-related plants or at cement manufacturing facilities.

All Categories

6a. Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in this mitigation measure may be used.

MM AIR-1f Prior to and during grading activities, the project applicant shall implement the following contingency control measures for large operations, as applicable, pursuant to South Coast Air Quality Management District Rule 403:

Earth Moving

1A. Cease all active operations; or
2A. Apply water to soil not more than 15 minutes prior to moving such soil.
0B. On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
1B. Apply chemical stabilizers prior to wind event; or
2B. Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; or
3B. Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; or
4B. Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.

Unpaved Roads

1C. Apply chemical stabilizers prior to wind event; or
2C. Apply water twice per hour during active operation; or
3C. Stop all vehicular traffic.

Open Storage Piles

1D. Apply water twice per hour; or
2D. Install temporary coverings.

Paved Road Track Out

1E. Cover all haul vehicles; or
2E. Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.

All Categories

1F. Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in this mitigation measure may be used.

MM AIR-1g Prior to the first grading activities, the applicant shall submit documentation to the City of Orange that demonstrates that all off-road construction equipment in excess of 50 horsepower is equipped with engines meeting the EPA Tier IV off-road engine emission standards.

Level of Significance After Mitigation

Less than significant impact.

Potential for Air Quality Standard Violation

| Impact AIR-2: | The project may violate any air quality standard or contribute substantially to an existing or projected air quality violation. |

Impact Analysis

This section addresses regional criteria pollutant impacts. The non-attainment regional pollutants of concern are ozone, PM_{10} and PM_{2.5}. Ozone is a regional pollutant formed by a photochemical reaction in the atmosphere and not directly emitted into the air. Ozone precursors, such as volatile organic compounds (VOC) and nitrogen oxides (NOx), react in the atmosphere in the presence of sunlight to form ozone. Therefore, the SCAQMD ozone threshold is based on the emissions of the ozone precursors VOC and NOx. This impact section includes analysis of, and significance determinations for, those pollutants. The concentration and operational emissions from the project were estimated using the California Emissions Estimator Model (CalEEMod Version 2016.3.1).
Construction Emissions

Construction emissions result from on-site and off-site activities. On-site emissions principally consist of exhaust emissions from the heavy-duty off-road construction equipment, on-site motor vehicle operation, and fugitive dust (mainly \( \text{PM}_{2.5} \) and \( \text{PM}_{10} \)) from disturbed soil. Off-site emissions are caused by motor vehicle exhaust from deliver and haul truck vehicles, work traffic, and road dust (mainly \( \text{PM}_{2.5} \) and \( \text{PM}_{10} \)). The majority of this fugitive dust will remain localized and will limited to the atmosphere around the project site. However, the potential for off-site impacts from fugitive dust exists unless control measures are implemented to reduce the particulate emissions from this source prior to leaving the project site.

The project construction was assumed to start in January 2019, and to last for 2 years. A conceptual construction schedule is provided in Table 3.3-6. There are no existing buildings or hardscape on-site, therefore, there is no demolition phase. In addition, because the net change between cut and fill provided by the client is 530,000 cubic yards, it was assumed that the grading phases would last 7 months. Therefore, the assumption was made that site preparation and grading phase would overlap, and part of grading phase and building construction phase would also overlap.

The emissions generated by construction equipment are based on the horsepower and load factors of the equipment. The inventory of construction equipment derived from the CalEEMod land use emission model for the land uses consistent with this project is shown as Table 3.3-7.

<table>
<thead>
<tr>
<th>Phase Name</th>
<th>Start Date</th>
<th>End Date</th>
<th>Number of working days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>1/1/2019</td>
<td>1/21/2019</td>
<td>15</td>
</tr>
<tr>
<td>Grading</td>
<td>1/1/2019</td>
<td>7/9/2019</td>
<td>136</td>
</tr>
<tr>
<td>Building Construction</td>
<td>1/22/2019</td>
<td>10/1/2020</td>
<td>443</td>
</tr>
<tr>
<td>Paving</td>
<td>10/2/2020</td>
<td>11/9/2020</td>
<td>27</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>11/10/2020</td>
<td>12/16/2020</td>
<td>27</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>—</td>
<td>—</td>
<td><strong>512</strong></td>
</tr>
</tbody>
</table>

### Table 3.3-7: Construction Equipment

<table>
<thead>
<tr>
<th>Activity</th>
<th>Equipment</th>
<th>Project Number</th>
<th>Project Hours per day</th>
<th>Default Horse-power</th>
<th>Default Load Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>Rubber Tired Dozers</td>
<td>3</td>
<td>8.00</td>
<td>247</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Tractors/Loaders/Backhoes</td>
<td>4</td>
<td>8.00</td>
<td>97</td>
<td>0.37</td>
</tr>
<tr>
<td>Grading</td>
<td>Excavators</td>
<td>2</td>
<td>8.00</td>
<td>158</td>
<td>0.38</td>
</tr>
<tr>
<td></td>
<td>Graders</td>
<td>1</td>
<td>8.00</td>
<td>187</td>
<td>0.41</td>
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<tr>
<td></td>
<td>Rubber Tired Dozers</td>
<td>1</td>
<td>8.00</td>
<td>247</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Scrapers</td>
<td>2</td>
<td>8.00</td>
<td>367</td>
<td>0.48</td>
</tr>
</tbody>
</table>
Table 3.3-7 (cont.): Construction Equipment

<table>
<thead>
<tr>
<th>Activity</th>
<th>Equipment</th>
<th>Project Number</th>
<th>Project Hours per day</th>
<th>Default Horse-power</th>
<th>Default Load Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Construction</td>
<td>Tractors/Loaders/Backhoes</td>
<td>2</td>
<td>8.00</td>
<td>97</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>Cranes</td>
<td>1</td>
<td>7.00</td>
<td>231</td>
<td>0.29</td>
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<tr>
<td></td>
<td>Forklifts</td>
<td>3</td>
<td>8.00</td>
<td>89</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Generator Sets</td>
<td>1</td>
<td>8.00</td>
<td>84</td>
<td>0.74</td>
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<tr>
<td></td>
<td>Tractors/Loaders/Backhoes</td>
<td>3</td>
<td>7.00</td>
<td>97</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>Welders</td>
<td>1</td>
<td>8.00</td>
<td>46</td>
<td>0.45</td>
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<tr>
<td>Paving</td>
<td>Pavers</td>
<td>2</td>
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<td>130</td>
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<td></td>
<td>Paving Equipment</td>
<td>2</td>
<td>8.00</td>
<td>132</td>
<td>0.36</td>
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<tr>
<td></td>
<td>Rollers</td>
<td>2</td>
<td>8.00</td>
<td>80</td>
<td>0.38</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>Air Compressors</td>
<td>1</td>
<td>6.00</td>
<td>78</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Source: see Appendix B

Table 3.3-8 presents the project construction emissions prior to the application of mitigation measures. The maximum daily emissions are compared with SCAQMD regional significance thresholds.

Table 3.3-8: Construction Maximum Daily Regional Emissions—Unmitigated

<table>
<thead>
<tr>
<th>Activity</th>
<th>NOx</th>
<th>VOC</th>
<th>CO</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>45.63</td>
<td>4.42</td>
<td>22.66</td>
<td>0.04</td>
<td>20.66</td>
<td>12.18</td>
</tr>
<tr>
<td>Grading</td>
<td>122.78</td>
<td>7.03</td>
<td>50.61</td>
<td>0.32</td>
<td>12.67</td>
<td>6.67</td>
</tr>
<tr>
<td>Building Construction—2019</td>
<td>31.41</td>
<td>3.76</td>
<td>27.53</td>
<td>0.32</td>
<td>4.48</td>
<td>2.13</td>
</tr>
<tr>
<td>Building Construction—2020</td>
<td>28.65</td>
<td>3.40</td>
<td>26.34</td>
<td>0.07</td>
<td>4.28</td>
<td>1.95</td>
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<tr>
<td>Paving</td>
<td>14.11</td>
<td>1.42</td>
<td>15.11</td>
<td>0.02</td>
<td>0.92</td>
<td>0.74</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>1.81</td>
<td>54.25</td>
<td>3.22</td>
<td>0.01</td>
<td>0.63</td>
<td>0.25</td>
</tr>
</tbody>
</table>

Maximum Daily Emissions

<table>
<thead>
<tr>
<th>Activity</th>
<th>NOx</th>
<th>VOC</th>
<th>CO</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCAQMD Air Quality Significance Thresholds</td>
<td>100</td>
<td>75</td>
<td>550</td>
<td>150</td>
<td>150</td>
<td>55</td>
</tr>
</tbody>
</table>

Exceed Threshold? Yes No No No No No

Notes:
NOx = nitrogen oxides VOC = Volatile Organic Compounds CO = carbon monoxide PM10 = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; PM2.5 = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers
The PM10 and PM2.5 emissions reflect the exhaust and “mitigated” fugitive dust emissions in accordance with SCAQMD Rule 403.
Source of emissions: FCS 2017, see Appendix B.
As shown in Table 3.3-8, the maximum daily construction emissions are below the recommended SCAQMD’s regional thresholds of significance, except for NOx. The project is estimated to generate up to 168.41 pounds of NOx per day, which exceed the 100 pounds/day thresholds of significance. Therefore, the project would result in a potentially significant impact. Consequently, mitigation measures are required.

**Operational Emissions**

As previously discussed, the pollutants of concern include VOC, NOx, PM10, and PM2.5. Operational emissions are generated by area, energy, and mobile sources. Area sources would include activities such as landscape maintenance and occasional architectural coatings. Energy sources would include electricity and natural gas combustion for space and water heating. Mobile sources would include vehicle trips associated with passenger cars. The SCAQMD regional emission significance thresholds were used. The operational emissions were also modeled for summer and winter seasons. Table 3.3-9 shows the project’s maximum daily emissions prior to the application of mitigation.

**Table 3.3-9: Maximum Daily Regional Operational-related Emissions—Unmitigated**

<table>
<thead>
<tr>
<th>Category</th>
<th>NOx</th>
<th>VOC</th>
<th>CO</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>0.12</td>
<td>5.34</td>
<td>10.67</td>
<td>0.00</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Energy</td>
<td>1.02</td>
<td>0.12</td>
<td>0.43</td>
<td>0.01</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Mobile</td>
<td>3.52</td>
<td>0.84</td>
<td>11.21</td>
<td>0.04</td>
<td>3.96</td>
<td>1.08</td>
</tr>
<tr>
<td>Total</td>
<td>4.66</td>
<td>6.30</td>
<td>22.31</td>
<td>0.05</td>
<td>4.10</td>
<td>1.22</td>
</tr>
<tr>
<td>SCAQMD Significance Thresholds (lbs/day)</td>
<td>55</td>
<td>55</td>
<td>550</td>
<td>150</td>
<td>150</td>
<td>55</td>
</tr>
<tr>
<td>Exceeding Thresholds?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
NOx = nitrogen oxides VOC = Volatile Organic Compounds CO = carbon monoxide PM10 = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; PM2.5 = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers

Source of emissions: FCS 2017—For each source, the maximum emissions between summer and winter are shown.
Source: See Appendix B.

As shown in Table 3.3-9, the maximum daily operational emissions are below the thresholds of significance. Therefore, the project’s operational-related impacts are less than significant.

With implementation of all the mitigation measures listed above, the project’s regional construction emissions are below the SCAQMD’s regional significance thresholds, as shown as Table 3.3-10.
Table 3.3-10: Maximum Daily Regional Construction Emissions—Mitigated

<table>
<thead>
<tr>
<th>Activity</th>
<th>Mass Daily Emissions (pounds per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOx</td>
</tr>
<tr>
<td>Site Preparation</td>
<td>2.07</td>
</tr>
<tr>
<td>Grading</td>
<td>71.56</td>
</tr>
<tr>
<td>Building Construction—2019</td>
<td>12.57</td>
</tr>
<tr>
<td>Building Construction—2020</td>
<td>11.70</td>
</tr>
<tr>
<td>Paving</td>
<td>1.26</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>0.25</td>
</tr>
<tr>
<td>Maximum Daily Emissions</td>
<td>84.13</td>
</tr>
<tr>
<td>SCAQMD Air Quality Significance Thresholds</td>
<td>100</td>
</tr>
<tr>
<td>Exceed Threshold?</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
- NOx = nitrogen oxides
- VOC = Volatile Organic Compounds
- CO = carbon monoxide
- PM10 = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less
- PM2.5 = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers
- The PM10 and PM2.5 emissions reflect the exhaust and “mitigated” fugitive dust emissions in accordance with SCAQMD Rule 403.
- Source of emissions: FCS 2017; see Appendix.

The project’s construction and operational-related emissions would be below SCAQMD’s thresholds with implementation of mitigation measures. Therefore, the project would not violate any air quality standard or contribute substantially to an existing or projected air quality violation. Impacts would be less than significant.

**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**
Implement Mitigation Measures AIR-1a through AIR-1g.

**Level of Significance After Mitigation**
Less than significant impact.
Cumulative Impacts

Impact AIR-3: The project may 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.

**Impact Analysis**

The project’s regional construction and operational emissions with Tier IV mitigation for off-road construction equipment were determined to be below the SCAQMD’s project-level regional thresholds of significance. 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. If an area is in non-attainment for a criteria pollutant, then the background concentration of that pollutant has historically exceeded the ambient air quality standard. It follows that if a project exceeds the regional thresholds for that non-attainment pollutant, then it would result in a cumulatively considerable net increase of that pollutant and result in a significant cumulative impact.

As discussed above, the region is non-attainment for the federal and state ozone standards, the state PM$_{10}$ standards, and the federal and state PM$_{2.5}$ standards. Therefore, a project that would not exceed the SCAQMD thresholds of significance on a project-level would also not result in a cumulatively considerable contribution to these regional air quality impacts. The impacts from the project would, therefore, be cumulatively less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

Implement Mitigation Measures AIR-1a through AIR-1g.

**Level of Significance After Mitigation**

Less than significant impact.

**Impacts on Sensitive Receptors**

Impact AIR-4: The project may expose sensitive receptors substantial pollutant concentrations.

**Impact Analysis**

To result in a less than significant impact, the following criteria must be true:

- **Criterion 1**: Localized significance threshold assessment: emissions and air quality impacts during project construction or operation must be below the local significance thresholds.

- **Criterion 2**: CO hot spot assessment must demonstrate that the project would not result in the development of a CO hot spot that would result in an exceedance of the CO ambient air quality standards.
- **Criterion 3**: The construction or operation of the project would not result in an exceedance of the health risk significance thresholds.

**Criterion 1: Localized Significance Threshold**

As mentioned in Section 3.3.3, the SCAQMD has recommended LSTs for project construction and operational emissions. The SCAQMD has prepared LST emission look-up tables that were developed for each SRA that can be used to determine whether a project may generate significant adverse localized air quality impacts. The SCAQMD has established LSTs for project construction and operation emissions for NO₂, CO, PM₁₀, and PM₂.₅. Project impacts for these pollutants are then compared against the applicable SCAQMD’s LSTs to determine the significance of the project impacts.

As noted in Section 3.3.3, the project is located within SRA 17 in central Orange County. The nearest sensitive receptors from the project site would be in the residential areas located within in 25 meters from the east edge of the project site.

**Construction**

The SCAQMD has published a “Fact Sheet for Applying CalEEMod to Localized Significance Thresholds” (SCAQMD 2011a). The CalEEMod calculates construction emissions based on the number of equipment hours and the maximum daily disturbance activity possible for each piece of equipment. To compare CalEEMod reported emissions against the LST lookup tables, the CEQA document should contain in its project design features or its mitigation measures the following parameters:

1. The off-road equipment list (including type of equipment, horsepower, and hours of operation) assumed for the day of construction activity with maximum emissions;

2. The maximum number of acres disturbed on the peak day the equipment list summarized in Table 3.3-11;

3. Any emission control devices added onto off-road equipment; and

4. Specific dust suppression techniques used on the day of construction activity with maximum emissions.

---

The LST emission look-up tables only apply to projects that their maximum daily disturbed area is less than or equal to 5 acres. Table 3.3-12 shows the project’s maximum daily disturbed acreage.

### Table 3.3-12: Maximum Daily Disturbed Acreage

<table>
<thead>
<tr>
<th>Activity</th>
<th>Equipment</th>
<th>Number</th>
<th>Acres/8 hr day</th>
<th>Total Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>Crawler Tractors</td>
<td>4</td>
<td>0.5</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Graders</td>
<td>0</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Rubber Tired Dozers</td>
<td>3</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>Scrapers</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Grading</td>
<td>Crawler Tractors</td>
<td>2</td>
<td>0.5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Graders</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Rubber Tired Dozers</td>
<td>1</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td></td>
<td>Scrapers</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Maximum Number of Acres Disturbed per Day</td>
<td>7.5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: South Coast AQMD, Fact Sheet for Applying CalEEMod to Localized Significance Thresholds, 2011a.

As shown in Table 3.3-12, the maximum daily disturbed acreage is 7.5 acres, which is greater than the maximum 5 acres per day limitation in using the LST emission lookup tables. However, the 7.5-acre emission thresholds should be higher than the 5-acre emission thresholds, since the more acreage disturbed per day, the more emissions the project should generate. Therefore, if the maximum daily emissions generated based on the 7.5 acres disturbed per day are below the 5-acre emission thresholds, the project’s localized air pollutant impacts should be less than significant for 7.5 acres. If on-site emissions exceed the LSTs, then the project would require a further air dispersion models for criteria pollutants.

Therefore, on-site emissions from construction activities were compared with the LSTs for a 5-acre site in SRA 17 at a distance of 25 meters to the nearest sensitive receptor. Table 3.3-13 shows the maximum daily on-site construction emissions.

### Table 3.3-13: Construction Localized Significance Analysis—Unmitigated

<table>
<thead>
<tr>
<th>Activity</th>
<th>NO₅</th>
<th>CO</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>45.57</td>
<td>22.06</td>
<td>20.46</td>
<td>12.13</td>
</tr>
<tr>
<td>Grading</td>
<td>54.52</td>
<td>33.38</td>
<td>10.52</td>
<td>5.73</td>
</tr>
<tr>
<td>Building Construction—2019</td>
<td>21.08</td>
<td>17.16</td>
<td>1.29</td>
<td>1.21</td>
</tr>
<tr>
<td>Building Construction—2020</td>
<td>19.19</td>
<td>16.85</td>
<td>1.12</td>
<td>1.05</td>
</tr>
<tr>
<td>Paving</td>
<td>14.07</td>
<td>14.65</td>
<td>0.75</td>
<td>0.69</td>
</tr>
</tbody>
</table>
Table 3.3-13 (cont.): Construction Localized Significance Analysis—Unmitigated

<table>
<thead>
<tr>
<th>Activity</th>
<th>NOₓ</th>
<th>CO</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Architectural Coating</td>
<td>1.68</td>
<td>1.83</td>
<td>0.11</td>
<td>0.11</td>
</tr>
<tr>
<td><strong>Maximum Daily On-Site Emissions</strong></td>
<td><strong>100.09</strong></td>
<td><strong>55.44</strong></td>
<td><strong>30.97</strong></td>
<td><strong>17.86</strong></td>
</tr>
<tr>
<td>Localized Significance Threshold</td>
<td>183</td>
<td>1253</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Exceed Threshold?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes:
NOₓ = nitrogen oxides; VOC = volatile organic compounds; CO = carbon monoxide
PM₁₀ = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less
PM₂.₅ = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers
The PM₁₀ and PM₂.₅ emissions reflect the exhaust and “mitigated” fugitive dust emissions in accordance with SCAQMD Rule 403.
Source of emissions: FCS 2017; Source of thresholds: South Coast Air Quality Management District 2009, for SRA 17, 25 meters, 5-acre site.

As shown in Table 3.3-13, unmitigated on-site PM₁₀, and PM₂.₅ emissions during construction exceed the LSTs. However, with Tier IV mitigation and Rule 403 fugitive dust control measures, PM₁₀, and PM₂.₅ emissions are reduced to levels less than the significance thresholds as shown in Table 3.3-14.

Table 3.3-14: Construction Localized Significance Analysis—Mitigated

<table>
<thead>
<tr>
<th>Activity</th>
<th>NOₓ</th>
<th>CO</th>
<th>PM₁₀</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>2.02</td>
<td>20.87</td>
<td>8.19</td>
<td>4.53</td>
</tr>
<tr>
<td>Grading</td>
<td>3.30</td>
<td>33.00</td>
<td>3.76</td>
<td>0.17</td>
</tr>
<tr>
<td>Building Construction—2019</td>
<td>2.23</td>
<td>17.46</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Building Construction—2020</td>
<td>2.23</td>
<td>17.46</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Paving</td>
<td>1.22</td>
<td>17.30</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>0.13</td>
<td>1.83</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Maximum Daily On-Site Emissions</strong></td>
<td><strong>5.53</strong></td>
<td><strong>53.87</strong></td>
<td><strong>11.95</strong></td>
<td><strong>4.70</strong></td>
</tr>
<tr>
<td>Localized Significance Threshold</td>
<td>183</td>
<td>1253</td>
<td>13</td>
<td>7</td>
</tr>
<tr>
<td>Exceed Threshold?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
NOₓ = nitrogen oxides; VOC = volatile organic compounds; CO = carbon monoxide
PM₁₀ = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less
PM₂.₅ = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers
The PM₁₀ and PM₂.₅ emissions reflect the exhaust and “mitigated” fugitive dust emissions in accordance with SCAQMD Rule 403.
Source of emissions: FCS 2017; see Appendix A.
Source of thresholds: South Coast Air Quality Management District 2009, for SRA 17, 25 meters, 5-acre site.
As shown in Table 3.3-14, the on-site construction related emissions after mitigation do not exceed the LSTs. If the project results in emissions that do not exceed the LSTs, it follows that those emissions would not cause or contribute to a local exceedance of appropriate ambient air quality standard. Therefore, the project would not expose receptors to substantial criteria pollutant concentrations from construction activities with the implementation of mitigation measures.

**Operations**

The project site consists of 129 single family houses (25 to 50 acres) and the preservation of the remaining acreage as open space. The operational-related on-site emissions would include activities such as landscape maintenance, occasional architectural coatings, and electricity and natural gas usage for space and water heating. Since the project is mainly residential area, it is not expected to generate relatively large amounts of pollutant emissions. In addition, the on-site emissions during operation are compared to the LSTs and summarized in Table 3.3-15. On-site emissions are compared with the LSTs for a 5-acre site in SRA 17 at a distance of 25 meters.

### Table 3.3-15: Operational Localized Significance Analysis—Unmitigated

<table>
<thead>
<tr>
<th>Emissions Source</th>
<th>NO&lt;sub&gt;x&lt;/sub&gt;</th>
<th>CO</th>
<th>PM&lt;sub&gt;10&lt;/sub&gt;</th>
<th>PM&lt;sub&gt;2.5&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>2.26</td>
<td>6.45</td>
<td>0.24</td>
<td>0.24</td>
</tr>
<tr>
<td>Energy</td>
<td>1.18</td>
<td>0.14</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Mobile&lt;sup&gt;1&lt;/sup&gt;</td>
<td>4.43</td>
<td>1.62</td>
<td>0.59</td>
<td>0.17</td>
</tr>
<tr>
<td>Total</td>
<td>7.87</td>
<td>8.21</td>
<td>0.93</td>
<td>0.50</td>
</tr>
<tr>
<td>Localized Significance Threshold</td>
<td>183</td>
<td>1253</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Exceeds Significance Threshold?</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
- NO<sub>x</sub> = nitrogen oxides VOC = Volatile Organic Compounds CO = carbon monoxide PM<sub>10</sub> = particulate matter with an aerodynamic resistance diameter of 10 micrometers or less; PM<sub>2.5</sub> = particulate matter with an aerodynamic resistance diameter of 2.5 micrometers
- <sup>1</sup> Assume on-site mobile travel average distance is 0.5 mile.
- Source of emissions: FCS 2017; see Appendix A.
- Source of thresholds: South Coast Air Quality Management District 2009, for SRA 17, 25 meters, 5-acre site.

As shown in Table 3.3-15, on-site project operational-related emissions would not exceed the operational LSTs. Therefore, the project would not expose receptors to substantial criteria pollutant concentration from operational-related activities.

**Criterion 2: Carbon Monoxide Hot Spot Analysis**

An adverse CO concentration, known as a “hot spot,” would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. At the time of the SCAQMD 1993 Handbook, the SoCAB was designated nonattainment under the California AAQS and National AAQS for CO.
It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SoCAB is now designated as attainment.

To establish a more accurate record of baseline CO concentrations affecting the SoCAB, a CO “hot spot” analysis was conducted in 2003 for four busy intersections in Los Angeles at the peak morning and afternoon time periods.

The analysis prepared for CO attainment in the SoCAB by the SCAQMD can be used to assist in evaluating the potential for CO exceedances in the SoCAB. CO attainment was thoroughly analyzed as part of the SCAQMD’s 2003 Air Quality Management Plan (2003 AQMP) and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan). As discussed in the 1992 CO Plan, peak carbon monoxide concentrations in the South Coast Air Basin are due to unusual meteorological and topographical conditions, and not due to the impact of particular intersections. Considering the region’s unique meteorological conditions and the increasingly stringent CO emissions standards, CO modeling was performed as part of 1992 CO Plan and subsequent plan updates and air quality management plans.

In the 1992 CO Plan, a CO hot spot analysis was conducted for four busy intersections in Los Angeles at the peak morning and afternoon time periods. The intersections evaluated included: Long Beach Boulevard and Imperial Highway (Lynwood); Wilshire Boulevard and Veteran Avenue (Westwood); Sunset Boulevard and Highland Avenue (Hollywood); and La Cienega Boulevard and Century Boulevard (Inglewood). These analyses did not predict a violation of CO standards. The busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which has a daily traffic volume of approximately 100,000 vehicles per day. The Los Angeles County Metropolitan Transportation Authority evaluated the LOS in the vicinity of the Wilshire Boulevard/Veteran Avenue intersection and found it to be Level E at peak morning traffic and Level F at peak afternoon traffic.

The Traffic Impact Analysis prepared by Linscott, Law & Greenspan, Engineers identified peak-hour traffic volumes for nine intersections affected by the project. The report provided scenarios for current year, year 2022 (operations start year) and year 2040.

As identified in the Traffic Impact Analysis, the maximum peak-hour intersection volume for year 2022 would occur at the East Chapman Avenue/Santiago Canyon Road/Jamboree Road intersection in the Cumulative Plus Project Scenario during the PM peak hour. The estimated cumulative traffic volume at this intersection is 5,661 PM peak-hour trips.

In addition, the maximum peak-hour intersection volume for year 2040 would occur at the E Santiago Canyon Road/N Cannon Street in the cumulative plus project scenario during PM peak hour. The estimated cumulative traffic volume at this intersection would be 7,483 PM peak-hour trips. All of the estimated intersection traffic volumes are substantially lower than the intersection
volumes analyzed in the 1992 CO Plan. Consequently at buildout of the project, according to the project Traffic Impact Analysis, none of the intersections in the vicinity of the project would have peak hourly traffic volumes exceeding those at the intersections modeled in the 2003 AQMP, nor would there be any reason unique to SoCAB meteorology to conclude that this intersection would yield higher CO concentrations if modeled in detail. As a result, the SoCAB has been designated as attainment for CO since 2007 and even very busy intersections do not result in exceedances of the CO standard. Therefore, the operation of the project would not be expected to generate a CO hot spot that would exceed the CO ambient air quality standards.

**Criterion 3: Construction Toxic Air Pollutants**

*Project-Specific Impacts during Construction and Operation*

DPM has been identified by the ARB as a carcinogenic substance. Major sources of DPM include off-road construction equipment and heavy-duty delivery truck activities. For purposes of this analysis, diesel particulate matter (DPM) is represented as exhaust emissions of PM$_{10}$.

The results of the health risk assessment (HRA) prepared for the project construction, for cancer risk, and long-term chronic cancer risk are summarized below. Air dispersion modeling was utilized to assess the project’s potential health risks using the current version of AERMOD (Version 16216r) air dispersion model, which is the air dispersion model accepted by the EPA and the SCAQMD for preparing HRAs. Exhaust emissions of DPM were estimated using the CalEEMod model (Version 2016.3.1). Table 3.3-16 summarizes the emission rates of unmitigated PM$_{10}$ and PM$_{10}$ with Tier IV mitigation.

**Table 3.3-16: Project PM$_{10}$ Construction Emissions—Tier IV Mitigation**

<table>
<thead>
<tr>
<th>Year</th>
<th>On-site DPM (grams/m$^2$/sec)</th>
<th>off-site DPM-WEST (grams/sec)</th>
<th>Off-site DPM-EAST (grams/sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Construction Emissions (Unmitigated)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>4.88E-07</td>
<td>4.69E-04</td>
<td>7.73E-04</td>
</tr>
<tr>
<td>2020</td>
<td>6.58E-08</td>
<td>4.45E-05</td>
<td>7.33E-05</td>
</tr>
<tr>
<td>Annual Construction Emissions (Tier IV Mitigation)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019</td>
<td>6.76E-09</td>
<td>4.69E-04</td>
<td>7.73E-04</td>
</tr>
<tr>
<td>2020</td>
<td>2.47E-09</td>
<td>4.45E-05</td>
<td>7.33E-05</td>
</tr>
</tbody>
</table>

Source: CalEEMod and FirstCarbon Solutions; see Appendix B.

The estimated health and hazard impacts at the maximum impacted sensitive receptor from the project’s construction emissions are provided in Table 3.3-17.
Table 3.3-17: Estimated Health Risks and Hazards: Project Construction—Unmitigated

<table>
<thead>
<tr>
<th>Source</th>
<th>Cancer Risk (risk per million)</th>
<th>Chronic Non-Cancer Hazard Index&lt;sup&gt;(2)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Infants&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>107.3</td>
<td>0.11</td>
</tr>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Child&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>27.8</td>
<td>0.11</td>
</tr>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Adult&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>3.0</td>
<td>0.11</td>
</tr>
<tr>
<td>Significance Threshold</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Exceeds Individual Source Threshold?</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
1. Maximum impacted sensitive receptor is a residence located approximately 25 meters east of the Project along the River Birch Circle near Sycamore Glen Drive.
2. Chronic non-cancer hazard index was estimated by dividing the maximum annual DPM concentration (as PM<sub>10</sub> exhaust) by the REL of 5 µg/m<sup>3</sup>.
Source: AERMOD and FirstCarbon Solutions; refer to Appendix B.

The sensitive receptor that has the highest cancer risks is located within in 25 meters (82 feet) from the east edge of the project site, at the corner of River Birch Circle near Sycamore Glen Drive. As noted in Table 3.3-17, the project’s construction DPM emissions do not exceed the cancer risk and non-cancer hazard index significance thresholds prior to mitigation measures. Therefore, the project is required to implement tier IV mitigation measures, as shown in Table 3.3-18.

Table 3.3-18: Estimated Health Risks and Hazards: Project Construction—With Tier IV Mitigation

<table>
<thead>
<tr>
<th>Source</th>
<th>Cancer Risk (risk per million)</th>
<th>Chronic Non-Cancer Hazard Index&lt;sup&gt;(2)&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Infants&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>1.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Child&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Risks and Hazards at the Maximum Impacted Sensitive Receptor (MIR): Adult&lt;sup&gt;(1)&lt;/sup&gt;</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Significance Threshold</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Exceeds Individual Source Threshold?</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Notes:
1. Maximum impacted sensitive receptor is a residence located approximately 25 meters east of the Project along the River Birch Circle near Sycamore Glen Drive.
2. Chronic non-cancer hazard index was estimated by dividing the maximum annual DPM concentration (as PM<sub>10</sub> exhaust) by the REL of 5 µg/m<sup>3</sup>.
Source: AERMOD and FirstCarbon Solutions; refer to Appendix B.
As noted in Table 3.3-17, the project’s construction DPM emissions do not exceed the cancer risk and non-cancer hazard index significance thresholds with Tier IV mitigation. Therefore, it would not result in a significant impact on nearby sensitive receptors during construction, after the implementation of Mitigation Measures AIR-1a through AIR-1g.

The residential nature of the project would not result in the emissions of TACs during project operation. Therefore, the operation of the project would not result in a significant health risk during operations.

**Cumulative HRA Impacts during Construction and Operation**

As presented in section 3.3.3 above, the projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant. Since this project does not exceed the project-specific thresholds after mitigation, it would not be considered to result in cumulatively significant impacts.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

Implement Mitigation Measures AIR-1a through AIR-1g.

**Level of Significance After Mitigation**

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.

Odor is typically a warning system that prevents animals and humans from consuming spoiled food or toxic materials. Odor-related symptoms reported in a number of studies include nervousness, headache, sleeplessness, fatigue, dizziness, nausea, loss of appetite, stomachache, sinus congestion, eye irritation, nose irritation, runny nose, sore throat, sough and asthma exacerbation (SCAQMD 2007).

The SCAQMD’s role is to protect the public’s health from air pollution by overseeing and enforcing regulations (SCAQMD 2007). The SCAQMD’s resolution activity for odor compliance is mandated under California Health & Safety Code Section 41700, and falls under SCAQMD Rule 402. The Public Nuisance Regulation states: “A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or
annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.”

During construction, the various diesel-powered vehicles and equipment in use on-site would create localized odors. These odors would be temporary and would not likely be noticeable beyond the project’s site boundaries. The potential for diesel odor impacts associated with construction activities at the project site is therefore less than significant. Land uses typically considered associated with odors include wastewater treatment facilities, waste-disposal facilities, or agricultural operations and these types of land uses are not located in the project’s vicinity. The project does not contain land uses typically associated with emitting objectionable odors.

During operation of the project, odors would primarily consist of vehicles traveling to the urban linear park and additionally from the use of equipment during landscaping and facility maintenance. These occurrences would not produce a significant amount of odors; therefore, 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.
3.4 - Biological Resources

3.4.1 - Introduction

This section 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 the Biological Resources Assessment prepared by ESA, the Jurisdictional Delineation prepared by PCR, and the Tree Survey prepared by PCR. The reports are provided in Appendix C.

3.4.2 - Environmental Setting

Natural Communities and Habitats

The project site contains 28 natural communities and habitats, which are summarized in Table 3.4-1. The locations of the natural communities and habitats are provided in Exhibit 3.4-1.

Table 3.4-1: Natural Community Summary

<table>
<thead>
<tr>
<th>Natural Community</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On-site</td>
</tr>
<tr>
<td>Southern Cottonwood—Willow Riparian Forest</td>
<td>12.79</td>
</tr>
<tr>
<td>Coastal Sage Scrub</td>
<td>0.57</td>
</tr>
<tr>
<td>Coastal Sage Scrub/Non-Native Herbaceous Cover</td>
<td>0.19</td>
</tr>
<tr>
<td>Coast Live Oak Woodland</td>
<td>0.33</td>
</tr>
<tr>
<td>Blue Elderberry Scrub</td>
<td>0.13</td>
</tr>
<tr>
<td>California Brittlebush Scrub</td>
<td>0.26</td>
</tr>
<tr>
<td>Laurel Sumac Scrub</td>
<td>0.38</td>
</tr>
<tr>
<td>Yerba Santa Scrub</td>
<td>0.31</td>
</tr>
<tr>
<td>Mule Fat Scrub</td>
<td>0.17</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.66</td>
</tr>
<tr>
<td>Giant Reed</td>
<td>0.44</td>
</tr>
<tr>
<td>Ornamental</td>
<td>0.49</td>
</tr>
<tr>
<td>Eucalyptus Woodland</td>
<td>0.43</td>
</tr>
<tr>
<td>Non-Native Grassland/Non-Native Herbaceous Cover</td>
<td>25.47</td>
</tr>
<tr>
<td>Non-Native Grassland/Disturbed</td>
<td>3.89</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover</td>
<td>5.11</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Black Willow Scrub</td>
<td>0.20</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Coastal Sage Scrub</td>
<td>0.43</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Mule Fat Scrub</td>
<td>0.26</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Ornamental</td>
<td>7.05</td>
</tr>
</tbody>
</table>
Table 3.4-1 (cont.): Natural Community Summary

<table>
<thead>
<tr>
<th>Natural Community</th>
<th>On-site</th>
<th>Off-site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Native Herbaceous Cover/Disturbed</td>
<td>0.19</td>
<td>—</td>
<td>0.19</td>
</tr>
<tr>
<td>Disturbed</td>
<td>19.46</td>
<td>—</td>
<td>19.46</td>
</tr>
<tr>
<td>Disturbed/Arroyo Willow Scrub</td>
<td>0.11</td>
<td>—</td>
<td>0.11</td>
</tr>
<tr>
<td>Disturbed/Black Willow Scrub</td>
<td>0.31</td>
<td>—</td>
<td>0.31</td>
</tr>
<tr>
<td>Disturbed/Coastal Sage Scrub</td>
<td>0.30</td>
<td>—</td>
<td>0.30</td>
</tr>
<tr>
<td>Disturbed/Mule Fat Scrub</td>
<td>0.03</td>
<td>—</td>
<td>0.03</td>
</tr>
<tr>
<td>Disturbed/Non-Native Herbaceous Cover</td>
<td>26.22</td>
<td>—</td>
<td>26.22</td>
</tr>
<tr>
<td>Developed</td>
<td>3.57</td>
<td>—</td>
<td>3.57</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>109.75</td>
<td>2.01</td>
<td>111.76</td>
</tr>
</tbody>
</table>


*Southern Cottonwood-Willow Riparian Forest*

Southern cottonwood-willow riparian forest is dominated by Fremont’s cottonwood (*Populus fremontii*), black cottonwood (*Populus trichocarpa*), black willow (*Salix gooddingii*), red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), and mule fat (*Baccharis salicifolia*). Other species found within this community include coast live oak (*Quercus agrifolia*), poison oak (*Toxicodendron diversilobum*), coast live oak (*Vitis sp.*), cocklebur (*Xanthium strumarium*), California sagebrush (*Artemisia californica*), western sycamore (*Platanus racemosa*), blue elderberry (*Sambucus nigra ssp. caerulea*), phacelia (*Phacelia sp.*), watercress (*Nasturtium officinale*), rush (*Juncus sp.*), spike rush (*Eleocharis sp.*), mugwort (*Artemisia douglasiana*), California blackberry (*Rubus ursinus*), giant reed (*Arundo donax*), and giant wild rye (*Leymus condensatus*). In addition, several non-native invasive species were observed, including Mexican fan palm (*Washingtonia robusta*), date palm (*Phoenix canariensis*), Peruvian peppertree (*Schinus molle*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), white cudweed (*Pseudognaphalium luteo-album*), and black mustard (*Brassica nigra*). Southern cottonwood-willow riparian forest is found throughout the northern portion of the project site within Santiago Creek.

*Coastal Sage Scrub*

Coastal sage scrub, which is covered under the County of Orange (Central/Coastal) Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP), is dominated by California sagebrush and California bush sunflower (*Encelia californica*). Other species within this community include coastal prickly pear (*Opuntia littoralis*), California buckwheat (*Eriogonum fasciculatum*), felt-leaved yerba santa (*Eriodictyon crassifolium*), deerweed (*Acmispon glaber*), Wright’s cudweed (*Pseudognaphalium canescens* ssp. *microcephalum*), poison oak, and black mustard. Coastal sage scrub is found along the northwestern portion of the project site.
Source: PCR Consulting, 2011

Exhibit 3.4-1
Natural Communities
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Coastal Sage Scrub/Non-Native Herbaceous Cover
This community consists of coastal sage scrub dominated by California sagebrush, but has a large component of weedy non-native herbaceous species, such as black mustard. Coastal sage scrub/non-native herbaceous cover is found along the northwestern portion of the project site.

Coast Live Oak Woodland
Coast live oak woodland is dominated by coast live oak with an understory of poison oak. Associated species found within this community include gum tree, blue elderberry, toyon, vinca (*Vinca major*), poison oak, wild grape, and English ivy. Coast live oak woodland occurs in patches throughout the southeastern portion of the project site.

Blue Elderberry Scrub
Blue elderberry scrub is dominated by patches of blue elderberry intermixed with patches of laurel sumac (*Malosma laurina*), some dead trees, and non-native herbaceous cover. This community occurs within the northern portion of the project site.

California Brittlebush Scrub
California brittlebush scrub consists of a nearly monotypic community of California brittlebush that is spaced out adjacent to the northern boundary of the project site along Mabury Avenue.

Laurel Sumac Scrub
Laurel sumac scrub is dominated by patches of laurel sumac intermixed non-native herbaceous cover along the northern slopes of the project site.

Yerba Santa Scrub
Yerba santa scrub is dominated by felt-leaved yerba santa within a nearly monotypic community. Associated species observed include California sagebrush, wild cucumber (*Marah macrocarpa*), scalebroom (*Lepidospartum squamatum*), coastal prickly pear, and black mustard. Yerba santa scrub occurs within the northwestern portion of the project site.

Mule Fat Scrub
Mule fat scrub is dominated by patches of mule fat. This community was found adjacent to Santiago Creek in the northern portion of the project site, and patches of mule fat were found adjacent to a ponded area in the southwestern portion of the project site. Associated species observed include southern California black walnut in the patch near Santiago Creek, and arroyo willow and non-native gum tree and Mexican fan palm near the ponded area.

Open Water
Open water was mapped in two ponded areas in the southwestern corner of the project site. Although ponded open water has not been observed here in previous years, due to the heavy rainfall during the 2016–2017 rainy season, ponding was observed during the vegetation mapping update.

Giant Reed
Large dense stands of giant reed dominate this community within Santiago Creek.
Ornamental
Ornamental landscaping consists of introduced trees and shrubs associated with development. Ornamental areas within the project site are dominated by non-native trees, including gum tree, pine (*Pinus sp.*), Mexican fan palm, and Peruvian peppertree, among other ornamental tree species. Ornamental landscaping occurs in patches throughout the southeastern portion of the project site.

Eucalyptus Woodland
Areas mapped as eucalyptus woodland consisted of windrows of planted gum trees of various species. Eucalyptus woodland was found within the southeastern portion of the project site.

Non-Native Grassland/Non-Native Herbaceous Cover
Non-native grassland/non-native herbaceous cover is dominated by non-native annual grasses, such as barley (*Hordeum sp.*), ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis*), peregrine saltbush (*Atriplex suberecta*), and intermixed with non-native herbaceous species such as black mustard. This community is found within large fields in the northern and western portions of the project site.

Non-Native Grassland/Disturbed
Non-native grassland/disturbed is dominated by non-native annual grasses and open, disturbed areas that support little or no vegetation. Non-native grassland/disturbed is found within the western portion of the project site.

Non-Native Herbaceous Cover
A non-native herbaceous cover area observed within the eastern portion of the project site is dominated by non-native, weedy species such as short-podded mustard (*Hirschfeldia incana*) and tocalote (*Centaurea melitensis*).

Non-Native Herbaceous Cover/Black Willow Scrub
Within the eastern portion of the project site, there is an open field exhibiting evidence of discing. Although most of this area is dominated by non-native herbaceous cover, weedy species, an isolated patch of a few black willow trees were planted along the southern edge of the field and comprise a small community of non-native herbaceous cover/black willow scrub. This community comprises less than ten individual black willow trees with an understory dominated by non-native herbaceous cover species.

Non-Native Herbaceous Cover/Coastal Sage Scrub
Non-native herbaceous cover/coastal sage scrub is dominated by weedy, non-native herbaceous species but exhibit sparse, remnant species of coastal sage scrub, including California sagebrush. Non-native herbaceous cover/coastal sage scrub is found within the northwestern portion of the project site.
Non-Native Herbaceous Cover/Mule Fat Scrub
Non-native herbaceous cover/mule fat scrub is dominated by weedy, non-native herbaceous species but contains patches of sparse mule fat. Non-native herbaceous cover/mule fat scrub is found within the western portion of the project site.

Non-Native Herbaceous Cover/Ornamental
Non-native herbaceous cover/ornamental is dominated by weedy, non-native herbaceous species such as black mustard, short-podded mustard, tree tobacco, Russian thistle (*Salsola tragus*), and castor bean, intermixed with large ornamental tree species such as gum tree, Mexican fan palm, date palm, Peruvian pepper tree, Brazilian pepper (*Schinus terebinthifolius*), and tree of heaven (*Ailanthus altissima*). A number of native southern California black walnuts are also found within this community. Non-native herbaceous cover/ornamental is found north of Santiago Creek along the northern boundary of the project site.

Non-Native Herbaceous Cover/Disturbed
Non-native herbaceous cover/disturbed is dominated by weedy, non-native herbaceous species interspersed with disturbed areas that contain little or no vegetation. Non-native herbaceous cover/disturbed is found in the central portion of the project site.

Disturbed
Disturbed or barren areas either completely lack vegetation or contain only very sparse nonnative herbaceous cover. Disturbed areas within the project site consist of paved roads, dirt roads that were compacted by vehicular use, areas that were previously disced or disturbed, or stockpiles of recycling materials. Disturbed areas occur in the southeastern portions of the project site.

Disturbed/Arroyo Willow Scrub
This community comprises disturbed areas due to the existing activities on-site and these deep trenches were excavated. Since water sometimes collects within these trenches, some sparse vegetation has begun to grow and contain disturbed areas with arroyo willows. This community occurs in the central-western portion of the project site.

Disturbed/Black Willow Scrub
This community comprises disturbed areas due to the existing activities on-site and these deep trenches were excavated. Since water sometimes collects within these trenches, some sparse vegetation has begun to grow and contain disturbed areas with black willows. This community occurs in the central-western portion of the project site.

Disturbed/Coastal Sage Scrub
Disturbed/coastal sage scrub is dominated by non-native herbaceous cover, weedy species but that exhibit components of a coastal sage scrub community, including California sagebrush and deerweed. Disturbed/coastal sage scrub is found within the northern central portion of the project site.
**Disturbed/Mule Fat Scrub**
A small, isolated patch of disturbed/mule fat scrub is located within the southern portion of the project site near the parking area. This community consists of sparse mule fat plants within an otherwise disturbed area.

**Disturbed/Non-Native Herbaceous Cover**
Disturbed/non-native herbaceous cover areas within the project site have various levels of previous disturbance and range from sparsely vegetated or bare areas to disturbed areas vegetated with non-native herbaceous cover species. Species observed within this community include horehound (*Marrubium vulgare*), short-podded mustard, black mustard, tree tobacco, tocalote, red-stemmed filaree (*Erodium cicutarium*), mule fat, broom baccharis (*Baccharis sarothroides*), slenderleaf iceplant (*Mesembryanthemum nodiflorum*), scarlet pimpernel (*Anagallis arvensis*), Russian thistle, fennel (*Foeniculum vulgare*), giant reed, laurel sumac, peregrine saltbush, and Mexican fan palm.

Disturbed/non-native herbaceous cover areas were found within the central and southwestern portion of the project site.

**Developed**
The developed area consists of a paved parking area or roadways along the southern boundary of the project site adjacent to Santiago Canyon Road.

**Sensitive Natural Communities**
Because of its ability to support “Target Species” and “Identified Species,” coastal sage scrub is a community that is covered under the NCCP/HCP. The project site includes 0.57 acre of coastal sage scrub and 0.19 acre of coastal sage scrub/non-native herbaceous cover. In addition, the project site supports four sensitive communities that are considered high priority for conservation by the CDFW’s List of California Terrestrial Natural Communities, including southern cottonwood-willow riparian forest (13.88 acres; 12.79 acres on-site and 1.09 acres off-site), blue elderberry scrub (0.13 acre on-site), California brittlebush scrub (0.26 acre on-site), and yerba santa scrub (0.31 acre on-site) (refer to Exhibit 3.4-2).

**Special-status Plant Species**

**Plant Species that Occur or with Potential to Occur**
Sensitive plants include those listed, or candidates for listing, by the United States Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW), and species considered sensitive by the California Native Plant Society (CNPS) (particularly Lists 1A, 1B, and 2). Many of the sensitive species addressed are also “Identified Species” under the NCCP/HCP and are considered covered species. Several sensitive plant species were reported in the CNDDB from the vicinity.
Exhibit 3.4-2
Sensitive Natural Communities

Source: PCR Consulting, 2011
Focused sensitive plant surveys were conducted within suitable habitat on the project site in May and August 2010, 2012, 2013, 2014; June and August 2015; and May 2017 for the following species:

- Coulter’s matilija poppy
- foothill mariposa lily
- chaparral sand verbena
- Braunton’s milk-vetch
- Coulter’s saltbush
- South Coast saltscale
- thread-leaved brodiaea
- Plummer’s mariposa lily
- southern tarplant
- long-spined spineflower
- many-stemmed dudleya
- Los Angeles sunflower
- Coulter’s goldfields
- mud nama
- Southern California black walnut
- Gambel’s water cress
- Peninsular nolina
- Allen’s pentachaeta
- white rabbit-tobacco
- chaparral ragwort
- San Bernardino aster

Only two of these sensitive plant species, southern California black walnut and southern tarplant, were observed within the project site during focused surveys, including the most recent surveys in May 2017, and are described below.

**Southern California Black Walnut**
Southern California black walnut is a CNPS List 4.2 species [“Watch List” plants of limited distribution; fairly endangered in California (20 to 80 percent occurrences threatened)]. Based on the 2017 survey, a total of 71 southern California black walnuts occur within the southern cottonwood-willow riparian forest and non-native herbaceous cover communities within the northwestern portion of the project site; refer to Exhibit 3.4-3.

**Southern Tarplant**
Southern tarplant is a CNPS List 1B.1 species (Plants Rare, Threatened, or Endangered in California and elsewhere; seriously endangered in California [over 80 percent of occurrences threatened/high degree and immediacy of threat]). Approximately 48,417 southern tarplant individuals were observed within disturbed habitat within the central portion of the project site and disturbed habitat within the southern portion of the project site during the focused sensitive plant surveys conducted in 2010; refer to Exhibit 3.4-3.

As part of the existing backfilling and material recycling operations, the project applicant salvaged the southern tarplant seed in 2010, 2013, and 2015. The southern tarplant seed was processed and stored at RSABG. A portion of the southern tarplant seed was donated to RSABG’s permanent conservation collection, and in 2015, a portion of the remaining seed was donated to Newport Banning Land Trust for restoration. The remainder of the salvaged southern tarplant seed will be relocated and sown on- and/or off-site within the open space areas to be avoided and preserved. A special-status plant survey was conducted on May 19, 2017 and fewer than 100 southern tarplants were observed on-site.
Plant Species Not Expected to Occur

The following plant species have been documented to occur within the region but are not expected to occur, due to lack of suitable habitat or because the project site is outside of the known range or elevation for these species: Tecate cypress (*Cupressus forbesii*), Malibu baccharis (*Baccharis malibuensis*), aphanisma (*Aphanisma blitoides*), big-leaved crownbeard (*Verbesina dissita*), Parish’s brittlescale (*Atriplex parishii*), Davidson’s saltscale (*Atriplex sernana var. davidsonii*), estuary seablite (*Suaeda esteroa*), Santa Monica Mountains dudleya (*Dudleya cymosa ssp. ovatifola*), Laguna Beach dudleya (*Dudleya stolonifera*), Joker’s monardella (*Monardella australis ssp. jokerstii*), intermediate monardella (*Monardella hypoleuca ssp. intermedia*), California Orcutt grass (*Orcuttia californica*), California beartongue (*Penstemon californicus*), Nuttall’s scrub oak (*Quercus dumosa*), heart-leaved pitcher sage (*Lepechinia cardiophylla*), salt spring checkerbloem (*Abronia villosa var. aurita*), Santa Ana River woollystar (*Eriastrum densifolium ssp. sanctorum*), prostrate vernal pool navarretia (*Navarretia prostrata*), San Fernando Valley spineflower (*Chorizanthe parryi var. fernandina*), coast woolly-heads (*Nemacaulis denudata var. denudata*), small-flowered mountain mahogany (*Cercocarpus minutiflorus*), salt marsh bird’s-beak (*Cordylanthus maritimus ssp. maritimus*), and Catalina mariposa lily (*Calochortus catalinae*).

Wildlife Species

Special-status wildlife include those species listed as Endangered or Threatened under the Federal Endangered Species Act (FESA) or California Endangered Species Act (CESA), candidates for listing by the USFWS or CDFW, and species of special concern to the CDFW. A number of sensitive wildlife species known to occur in the region were reported in the CNDDB. Many of the sensitive species addressed are also included as “Identified Species” and are covered under the NCCP/HCP. In addition, a few species were included in the table of sensitive wildlife presented below that have no Federal or State status, but that were included in the NCCP/HCP. These “Target Species” are included and analyzed in this document to provide a comprehensive list of species regardless of their Federal or State status. Six sensitive wildlife species or NCCP/HCP species which were observed on-site include white-tailed kite (*Elanus leucurus*), yellow-breasted chat (*Icteria virens*), coastal California gnatcatcher, least Bell’s vireo, willow flycatcher (*Empidonax traillii*), and coyote (*Canis latrans*).

Focused sensitive wildlife surveys for arroyo toad, burrowing owl, coastal California gnatcatcher, least Bell’s vireo, and southwestern willow flycatcher were conducted. An analysis of sensitive wildlife species is presented as follows.

The following wildlife species have been documented to occur within the region, but are not expected to occur because of lack of suitable habitat, the determination that they are not present on-site, or because the project site is outside of the known range for these species:
Exhibit 3.4-3
Special-Status Plant Species

Source: PCR Consulting, 2011
• San Diego fairy shrimp (*Branchinecta sandiegonensis*)
• Riverside fairy shrimp (*Streptocephalus woottoni*)
• Quino checkerspot butterfly (*Euphydryas editha quino*)
• Santa Ana sucker (*Catostomus santaanae*)
• Santa Ana speckled dace (*Rhinchithys osculus* ssp. 3)
• western spadefoot (*Spea hammondii*)
• black-bellied slender salamander (*Batrachoseps nigriventris*)
• northern leopard frog (*Rana pipiens*)
• coastal rosy boa (*Charina trivirgata roseofusca*)
• ring-necked snake (*Diadophis punctatus*)
• two-striped garter snake (*Thamnophis hammondii*)
• western pond turtle (*Actinemys marmorata*)
• golden eagle (*Aquila chrysaetos*)
• western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
• western snowy plover (*Charadrius alexandrinus nivosus*)
• grasshopper sparrow (*Amodramus savannarum*)
• Belding’s savannah sparrow (*Passerculus sandwichiae beldingi*)
• California least tern (*Sternula antillarum browni*)
• tri-colored blackbird (*Agelaius tricolor*)
• cactus wren (*Campylorhynchus brunneicapillus*)
• California black rail (*Laterallus jamaicensis*)
• light-footed clapper rail (*Rallus longirostris levipes*)
• pocketed free-tailed bat (*Nyctinomops femorosaccus*)
• big free-tailed bat (*Nyctinomops macrotis*)
• Mexican long-tongued bat (*Choeronycteris mexicana*)
• southern California saltmarsh shrew (*Sorex ornatus salicornicus*)
• Pacific pocket mouse (*Perognathus longimembris pacificus*)
• southern grasshopper mouse (*Onychomys torridus ramona*)
• American badger (*Taxidea taxus*)

Because of the presence of suitable habitat, focused surveys were conducted for arroyo toad, burrowing owl, coastal California gnatcatcher, least Bell’s vireo, and southwestern willow flycatcher, and are discussed in further detail as follows.

Arroyo Toad
The arroyo toad is a Federal Endangered Species and a Species of Special Concern. Focused surveys for this species were conducted by Michael Brandman Associates (MBA) in 2008 and PCR in 2010. No arroyo toads were found on-site. Because of the negative results of focused surveys and lack of suitable habitat for this species on-site, this species is not expected to occur within the project site. Therefore, surveys were not repeated after 2010.

Burrowing Owl
The burrowing owl is a Species of Special Concern species. Focused surveys were conducted for this species by PCR in 2012, 2013, 2014, and 2017. No burrowing owl were observed during focused surveys and, because of the negative results of focused surveys, are not expected to occur within the project site.

Coastal California Gnatcatcher
The coastal California gnatcatcher is a Federal Threatened and Species of Special Concern species. This species is also a “Target Species” of the NCCP/HCP. Focused surveys were conducted for this species by MBA in 2008 and PCR in 2010, 2012, 2013, 2014, 2015, and by ESA in 2017. An incidental sighting of one dispersing coastal California gnatcatcher was observed on August 3, 2010 during a focused special-status plant survey conducted by PCR. Because the coastal California gnatcatcher was observed in disturbed/ruderal habitat (and not coastal sage scrub habitat), and since results of the focused breeding season survey were negative in 2010, it is believed this individual observed was likely a juvenile dispersing through the project site. No coastal California gnatcatchers were observed on-site during focused breeding season surveys conducted in 2008, 2010, 2012, or 2013. During focused surveys conducted in 2014, a coastal California gnatcatcher pair was observed within the western portion of the project site on March 27, 2014. The pair did not appear to be engaged in any definite breeding-related activity and was not observed within the project site on subsequent surveys conducted during that season. However, what was believed to be the same pair was later observed off-site on May 2, 2014 on the west side of Cannon Street in a more extensive area of poor-quality coastal sage scrub habitat. No coastal California gnatcatchers were observed during 2015 and 2017 focused breeding season surveys. In addition, incidental sightings of two separate coastal California gnatcatcher individuals were observed on both June 9 and 27, 2017 by ESA biologist Amy Lee and Michael Cady during jurisdictional delineation surveys. The locations of the sightings are depicted on Exhibit 3.4-4. Because the habitat where the coastal California gnatcatchers were seen were disturbed/non-native herbaceous cover or within disturbed areas perched on mule fat (and not coastal sage scrub), and since results of the focused breeding season surveys were negative (for 2017 focused surveys), it is believed these individuals observed were likely juveniles dispersing through the project site. A number of coastal California gnatcatcher occurrences are documented in the USFWS occurrences database within the vicinity of the project site. Thus, it is likely that the coastal California gnatcatchers observed on-site are foraging or dispersing through the project site from adjacent areas, particularly off-site areas downstream of the project site to the west. However, no breeding pairs were found within the project site during the 2008, 2010, 2012, 2013, 2014, 2015, or 2017 focused breeding
season surveys. Furthermore, coastal California gnatcatcher is a covered species with implementation of the NCCP/HCP. The project site is not within critical habitat for this species; the nearest final critical habitat for coastal California gnatcatcher is 0.3 mile south of the project site.

**Least Bell’s Vireo**

The least Bell’s vireo is a Federal Endangered and State Endangered species. Least Bell’s vireo is conditionally covered under the NCCP/HCP. Focused surveys were conducted for this species by MBA in 2008 and PCR in 2010 and 2012. Least Bell’s vireo was observed within the project site during focused surveys in 2008, 2010, and 2017; none were observed during the 2012, 2013, 2014, or 2015 surveys. During the 2010 surveys conducted by PCR, a pair of least Bell’s vireo was observed within the canopy of the southern cottonwood-willow riparian forest during the May 16, 2010 survey. Only the male least Bell’s vireo was seen or heard during subsequent surveys (on May 26, June 5 and 16, July 17, and July 27, 2010). The location of least Bell’s vireo territory on-site that was delineated by MBA is shown in Exhibit 3.4-4. Least Bell’s vireo was not detected during surveys in 2012, 2013, 2014, or 2015. However, two separate individual males were detected by sight and vocalization during the 2017 focused surveys, but because of the presence of least Bell’s vireo within the southern cottonwood-willow riparian forest located within the project site, the entire extent of the southern cottonwood-willow riparian forest has been evaluated as potential habitat for this species, as depicted in Exhibit 3.4-4.

**Southwestern Willow Flycatcher**

The southwestern willow flycatcher is a Federal Endangered and State Endangered species. The project site is not within critical habitat for this species. The southwestern willow flycatcher is conditionally covered under the NCCP/HCP. Focused surveys were conducted for this species by MBA in 2008 and PCR in 2010, 2012, 2013, 2014, and 2015, and by ESA in 2017. No southwestern willow flycatchers were observed on-site during focused surveys. However, willow flycatchers (not the southwestern subspecies) were observed during the 2012 survey, as shown in Exhibit 3.4-4. Two willow flycatchers were observed foraging and calling in the trees within the non-native herbaceous cover/black willow scrub community that border the fallow field in the eastern portion of the project site.

The habitat that these willow flycatchers were observed within is considered unsuitable as potential nesting habitat; therefore, it is assumed that both birds were migrants passing through the area and are not the southwestern willow flycatcher subspecies. In addition, one willow flycatcher was observed calling in two locations within southern cottonwood-willow riparian forest within the north-central portion of the project site. The habitat that this willow flycatcher was observed in is considered suitable for nesting; however, no breeding willow flycatchers were observed during the focused surveys.

**Jurisdictional Features**

The project site contains one perennial United States Geological Survey (USGS) blueline stream (Santiago Creek) and five associated tributaries, Tributaries A, B, C, D, and E. Total jurisdiction within the project site consists of 6.065 linear feet of perennial streambed that supports approximately 4.53

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1 Willow flycatcher (not the southwestern subspecies) were also surveyed for during the focused surveys for southwestern willow flycatcher.
acres of United States Army Corps of Engineers (USACE)/Regional Water Quality Control Board (RWQCB) jurisdictional “waters of the U.S.”/“waters of the State,” of which 1.33 acres are wetlands, and 14.10 acres of CDFW jurisdictional streambed and associated riparian vegetation, as summarized in Table 3.4-2 and shown on Exhibit 3.4-5.

### Table 3.4-2: Jurisdictional Feature Summary

<table>
<thead>
<tr>
<th>Location</th>
<th>Feature</th>
<th>Length</th>
<th>USACE/RWQCB</th>
<th>CDFW</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-site</td>
<td>Santiago Creek</td>
<td>5,355</td>
<td>4.18 (1.19)</td>
<td>13.46</td>
<td>Perennial</td>
</tr>
<tr>
<td></td>
<td>Tributary A</td>
<td>68</td>
<td>&lt;0.01</td>
<td>N/A*</td>
<td>Ephemeral</td>
</tr>
<tr>
<td></td>
<td>Tributary B</td>
<td>48</td>
<td>0.01</td>
<td>N/A*</td>
<td>Ephemeral</td>
</tr>
<tr>
<td></td>
<td>Tributary C</td>
<td>51</td>
<td>0.02</td>
<td>N/A*</td>
<td>Perennial</td>
</tr>
<tr>
<td></td>
<td>Tributary D</td>
<td>184</td>
<td>0.03</td>
<td>0.16</td>
<td>Intermittent</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>5,686</td>
<td>4.24 (1.19)</td>
<td>13.62</td>
<td>—</td>
</tr>
<tr>
<td>Off-site</td>
<td>Santiago Creek</td>
<td>147</td>
<td>0.16 (0.07)</td>
<td>0.22</td>
<td>Perennial</td>
</tr>
<tr>
<td></td>
<td>Tributary E</td>
<td>232</td>
<td>0.13 (0.07)</td>
<td>0.26</td>
<td>Perennial</td>
</tr>
<tr>
<td></td>
<td>Subtotal</td>
<td>379</td>
<td>0.29 (0.14)</td>
<td>0.48</td>
<td>—</td>
</tr>
<tr>
<td>Total</td>
<td>—</td>
<td>6,065</td>
<td>4.53 (1.33)</td>
<td>14.10</td>
<td>—</td>
</tr>
</tbody>
</table>

**Notes:**
Jurisdictional acreages overlap and are not additive

* RWQCB acreages represent the portion of USACE jurisdiction that meets the three-parameter definition of a wetland
* Tributaries outlet within Santiago Creek and are therefore encompassed by the CDFW jurisdiction already quantified for Santiago Creek

Source: PCR, 2013.

The Santiago Creek Watershed is approximately 99 square miles in size measured from the point where the stream enters the Santa Ana River in the City of Santa Ana up to the southwest-facing slopes of the Santa Ana Mountains in the Cleveland National Forest. Santiago Creek is a USGS blueline drainage that supports regional flow from a significant upstream watershed that drains several major canyons associated with the Santa Ana Mountains. The majority of canyon runoff from the Santa Ana Mountains drains to the Santiago Reservoir, which then conveys flow to the Villa Park Dam facility located approximately 1.25 miles upstream of the project site. One major canyon feature known as Walnut Canyon, and several minor canyon features associated with the adjacent Santa Ana Mountain foothills to the north/northeast also convey flow to Santiago Creek between the Villa Park Dam and the project site. Currently, five drainage outlets flow into Santiago Creek, including a large concrete box culvert that transports flows from Handy Creek, and an underground storm drain, which conveys flows from the residential development to the north. Flows conveyed through the project site ultimately discharge to the Pacific Ocean via the Santa Ana River located approximately 7 miles southwest of the project site.
Exhibit 3.4-4
Special-Status Wildlife Species

Source: PCR Consulting, 2011
The on-site portion of Santiago Creek is an incised perennial USGS blueline drainage that primarily supports southern cottonwood-willow riparian forest, as well as the development of fringe wetlands adjacent to the active channel. Santiago Creek bifurcates into two streambeds near the center of the site, which ultimately rejoin in the western portion of the site as a single drainage feature. Soils associated with Santiago Creek were dominated by sandy loam soils underlain by less permeable silty clay soils or granitic bedrock.

Wildlife Movement

Wildlife corridors link together areas of suitable habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated “islands” of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic material.

Corridors effectively act as links between different populations of a species. A group of smaller populations (termed “demes”) linked together via a system of corridors is termed a “metapopulation.” The long-term health of each deme within the metapopulation is dependent upon its size and the frequency of interchange of individuals (immigration vs. emigration). The smaller the deme, the more important immigration becomes, because prolonged inbreeding with the same individuals can reduce genetic variability. Immigrant individuals that move into the deme from adjoining demes mate with individuals and supply that deme with new genes and gene combinations that increases overall genetic diversity. An increase in a population’s genetic variability is generally associated with an increase in a population’s health and long-term viability.

Corridors mitigate the effects of habitat fragmentation by: (1) allowing animals to move between remaining habitats, which allows depleted populations to be replenished and promotes genetic diversity; (2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (such as fires or disease) will result in population or local species extinction; and (3) serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs.

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions); (2) seasonal migration; and, (3) movements related to home range activities (foraging for food or water, defending territories, searching for mates, breeding areas, or cover). A number of terms have been used in various wildlife movement studies, such as “wildlife corridor,” “travel route,” and “wildlife crossing” to refer to areas in which wildlife move from one area to another. To clarify the meaning of these terms and facilitate the discussion on wildlife movement in this study, these terms are defined as follows:

- **Travel Route:** A landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in
moving from one area to another; it contains adequate food, water, or cover while moving between habitat areas; and provides a relatively direct link between target habitat areas.

- **Wildlife Corridor:** A piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bounded by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, or water to support species and facilitate movement while in the corridor. Larger, landscape-level corridors (often referred to as “habitat or landscape linkages”) can provide both transitory and resident habitat for a variety of species.

- **Wildlife Crossing:** A small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings typically are manmade and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These are often “choke points” along a movement corridor.

**Wildlife Movement within the Project Site**

From a regional perspective, the project site abuts Santiago Oaks Regional Park along the northeastern most portion of the project site, and is approximately 0.5 mile northwest of Santiago Creek Recharge Basin. The project site is situated approximately 0.6 mile northeast of El Modena Open Space, 2.4 miles north-northwest of Peters Canyon Reservoir, 3.8 miles northwest of Irvine Lake, and 2.0 miles west of the Santa Ana Mountains (Cleveland National Forest). The project site is not within NCCP/HCP established reserve assembly or wildlife corridors. Santiago Creek runs through the northern portion of the project site, and merges with the Santa Ana River approximately 7.0 miles southwest of the project site. Because of the past urbanization of the region, large open space areas in the immediate vicinity of the project site are limited to Santiago Oaks Regional Park, Santiago Creek Recharge Basin, and El Modena Open Space. The project site is immediately surrounded by residential development to the north and south, which may deter the movement of larger mammals that require larger home range areas and dispersal distances or dense vegetative cover. However, species that are less restricted in movement pathway requirements or are adapted to urban areas (e.g., raccoon, skunk, coyote, birds) likely move through the project site.

From east to west, the project site is bordered by Santiago Oaks Regional Park (to the east) and vacant land that connects to the Santiago Creek Recharge Basin (to the west). Santiago Creek provides habitat that connects Santiago Oaks Regional Park to the Santiago Creek Recharge Basin. Although there is somewhat limited riparian habitat downstream of the project site associated with the Santiago Creek Recharge Basin, the portion of Santiago Creek that is found within the project site provides dense riparian and wetland habitat and thus functions as a wildlife movement corridor which supports wildlife movement within and through the site. In addition, by providing resources, such as a perennial water source (for a variety of species, including several fishes), foraging habitat, nesting and den sites, and cover (for both predator and prey species), the project site provides live-in and movement habitat for many invertebrate, fish, herptile, avian, and mammal species, including NCCP/HCP identified species (such as least Bell’s vireo and coyote, both of which were observed on-site).
Although Santiago Creek is channelized and surrounded by development along portions of its extent, Santiago Creek serves as a corridor for wildlife movement by providing patches of habitat, as well as a water source, which connect the Santa Ana Mountains to the Santa Ana River, and eventually flows out to the Pacific Ocean. Thus, the habitat associated with Santiago Creek within the northern portion of the project site supports live-in and movement habitat for species on a local scale (i.e., some limited live-in habitat for fish, and live-in and at least marginal movement habitat for amphibian, reptile, bird, and mammal species), and likely functions to facilitate wildlife movement for a number of species on a regional scale.

Trees

PCR conducted a tree survey in 2012 that indicated that there were 323 trees within the project site. Common tree species include lemon bottlebrush, eucalyptus, coast live oak, and willow. Most of the trees (73 percent) were found to be in fair condition, with 9 percent in good or excellent condition, and 12 percent in poor condition. Nine trees were found to be dead or nearly dead.

3.4.3 - Regulatory Framework

Federal

Federal Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as “any species which is in danger of extinction throughout all or a significant portion of its range.” A threatened species is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.” Under provisions of Section 9(a)(1)(B) of the FESA, unless properly permitted, it is unlawful to “take” any listed species. “Take” is defined in Section 3(18) of FESA: “. . . harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Further, the USFWS, through regulation, has interpreted the terms “harm” and “harass” to include certain types of habitat modification as forms of “take.” These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action which could affect a federally listed plant or animal species, the property owner and agency are required to consult with USFWS pursuant to Section 7 of the ESA if there is a federal nexus, or pursuant to Section 10 of the ESA. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants.

Some of the USFWS offices maintain a database of listed species within their jurisdiction, for example the Sacramento and Carlsbad offices. The Carlsbad USFWS Office jurisdiction encompasses the counties of Los Angeles, Orange, Riverside, San Bernardino, Imperial, and San Diego.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects individuals as well as any part, nest, or eggs of any bird listed as migratory. In practice, federal permits issued for activities that potentially impact migratory birds typically have conditions that require surveys for nesting birds prior to project activities which may result in disturbance. In the event nesting is observed, a buffer area with a
specified radius must be established, within which no disturbance or intrusion is allowed until the young have fledged and left the nest, or it has been determined that the nest has failed. If not otherwise specified in the permit, the size of the buffer area varies with species and local circumstances (e.g., presence of busy roads, intervening topography, etc.), and is based on the professional judgment of a monitoring biologist. A list of migratory bird species protected under the MBTA is published by USFWS.

**Clean Water Act**

*Section 404*

Section 404 of the Clean Water Act (CWA) regulates the discharge of dredged or fill material into waters of the U.S. and authorizes the Secretary of the Army, through the Chief of Engineers, to issue permits for such actions. Implementing regulations for the CWA define waters of the U.S. as “rivers, creeks, streams, and lakes extending to their headwaters and any associated wetlands.” Wetlands are defined as “areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions.” The permit review process entails an assessment of potentially adverse impacts to USACE jurisdictional Waters of the U.S.

Over the years, the USACE has modified its regulations, typically due to evolving policy or judicial decisions, through the issuance of Regulatory Guidance Letters, memorandums, or more expansive instruction guidebooks. These guidance documents help to update and define how jurisdiction is claimed, and how these waters of the U.S. will be regulated. The most recent, significant modification occurred on June 5, 2007, subsequently updated in December 2008, when the USACE and the U.S. Environmental Protection Agency (EPA) issued a series of guidance documents outlining the requirements and procedures, effective immediately, to establish jurisdiction under Section 404 of the CWA and the Section 10 of the Rivers and Harbors Act of 1899. These documents are intended to be used for all jurisdictional delineations and provide specific guidance for the jurisdictional determination of potentially jurisdictional features affected by the U.S. Supreme Court rulings in *Rapanos v. the United States* and *Carabell v. the United States* 547 U.S. 715 (2006) (jointly referred to as Rapanos).

The Rapanos case outlines the conditions and criteria used by the USACE to assess and claim jurisdiction over non-isolated, non-navigable, ephemeral tributaries. Under a plurality ruling, the Court noted that certain “not relatively permanent” (i.e., ephemeral), non-navigable tributaries must have a “significant nexus” to downstream traditional navigable waters to be jurisdictional. An ephemeral tributary has a significant nexus to downstream navigable “waters” when it has “more than a speculative or an insubstantial effect on the chemical, physical, and/or biological integrity of a Traditional Navigable Water (TNW).” A significant nexus is established through the consideration of a variety of hydrologic, geologic and ecological factors specific to the particular drainage feature in question. For drainage features that do not meet the significant nexus criteria, a significant nexus determination is provided by the USACE to the EPA for the final determination of federal jurisdiction. Drainage features that do not meet the significant nexus criteria based on completion of an AJD, and/or are determined to be isolated pursuant to the SWANCC ruling (see below), may still be
regulated by CDFW under Fish and Game Code Section 1600 or the RWQCB under the Porter-Cologne Water Quality Act.

On January 15, 2003, the USACE and EPA issued a Joint Memorandum to provide clarifying guidance regarding the United States Supreme Court ruling in the Solid Waste Agency of Northern Cook County v. United States Army Corps of Engineers, No. 99-1178 (January 9, 2001) ("the SWANCC ruling"), (Federal Register: Vol. 68, No. 10.). This ruling held that the CWA does not give the federal government regulatory authority over non-navigable, isolated, intrastate waters. As a result of this decision, some previously regulated depressional areas such as mudflats, sandflats, wetlands, prairie potholes, wet meadows, playa lakes, natural ponds, and vernal pools, which are not hydrologically connected to other intra- or inter-state “waters of the U.S.,” are no longer regulated by the USACE.

Section 401

The mission of the RWQCB is to develop and enforce water quality objectives and implement plans that will best protect the beneficial uses of the state’s waters, recognizing local differences in climate, topography, geology, and hydrology. The California RWQCB is responsible for implementing compliance not only with state codes such as the California Water Code but also some federal acts such as Section 401 of the CWA. Section 401 of the CWA requires that any applicant for a federal permit for activities that involve a discharge to waters of the state shall provide the federal permitting agency with a certification from the state in which the discharge is proposed that states that the discharge will comply with the applicable provisions of the federal CWA. As such, before the USACE will issue a CWA Section 404 permit, applicants must apply for and receive a Section 401 water quality certification (WQC) from the RWQCB. The RWQCB regulates “discharging waste, or proposing to discharge waste, within any region that could affect “waters of the state” (Water Code § 13260 (a)), pursuant to provisions of the Porter-Cologne Water Quality Control Act which defines RWQCB jurisdictional “waters of the state” as “any surface water or groundwater, including saline waters, within the boundaries of the state” (Water Code § 13050).

With the exception of isolated waters and wetlands, most discharges of fill to waters of the state are also subject to a CWA Section 404 permit. If a CWA Section 404 permit is not required for the project, the RWQCB may still require issuance of Waste Discharge Requirements (WDR) under the Porter-Cologne Water Quality Control Act. The RWQCB may regulate isolated waters that are not under jurisdiction of the USACE through issuance of WDR’s. However, projects that obtain a Section 401 WQC are simultaneously enrolled in a statewide general WDR. Processing of Section 401 WQC’s generally requires submittal of 1) a construction storm water pollution prevention plan (SWPPP), 2) a final water quality technical report that demonstrates that post-construction storm water Best Management Practices (BMPs) comply with the local design standards for municipal storm drain permits (MS4 permits) implemented by the State Water Resources Control Board effective January 1, 2011, and 3) a conceptual Habitat Mitigation and Monitoring Plan (HMMP) to compensate for permanent impacts to RWQCB waters, if any. In addition to submittal of a draft CEQA document, a WQC application typically requires a discussion of avoidance and minimization of impacts to RWQCB jurisdictional resources, and efforts to protect beneficial uses as defined by the local RWQCB basin plan for the project. The RWQCB cannot issue a Section 401 WQC until the project CEQA document is certified by the lead agency.
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 CDFW when preparing 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 in diameter at breast height (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 (RWQCBs) 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 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. The following identifies the definitions of the CNPS ranks:

- **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.
Regional

County of Orange (Central/Coastal) Natural Community Conservation Plan/Habitat Conservation Plan

The project site is within the central subregion of the County of Orange (Central/Coastal) NCCP/HCP, as shown in Exhibit 3.4-6. The NCCP/HCP was reviewed and approved by the USFWS and CDFW in 1996 to address protection and management of coastal sage scrub habitat and coastal sage scrub-obligate species, as well as other covered habitats and species, and mitigate anticipated impacts on those habitats and species on a programmatic, subregional level rather than on a project-by-project, single-species basis. A habitat reserve in excess of 37,000 acres was established for the protection of coastal sage scrub, other upland habitats, the coastal California gnatcatcher, and the other primarily coastal sage scrub-dependent species identified in the NCCP/HCP. Specifically, the NCCP/HCP, the USFWS, and the CDFW authorized take of 39 identified species of plants and wildlife (including covered and conditionally covered species). Further, the NCCP/HCP contains requirements for adaptive management, interim management, and funding management for the reserve as well as procedures and minimization measures related to the take of identified species and habitat. Thus, the NCCP/HCP provides for the protection and management of a broad range of plant and wildlife populations while providing certainty to the public and affected landowners with respect to the location of future development and open space in the subregion.

The NCCP/HCP provides for the protection of a number of plant and animal species, referred to as Target Species and Identified Species. There are also identified NCCP/HCP species that have conditional regulatory coverage under the NCCP/HCP referred to as conditionally covered Identified Species. The conservation and management of these species is provided for under the NCCP. A development activity authorized under the NCCP/HCP necessarily includes protection of these species and also means that no further action under CESA or FESA is required for the approved activity should any of the Target or Identified Species be subsequently listed as endangered or threatened under either of these Acts. As a consequence, Target and Identified Species are considered sensitive.

Local

City of Orange

General Plan

The City of Orange General Plan sets forth the following goals and policies relevant to biological resources:

- **Goal 4.0**: Conserve and protect wildlife habitat, plant and animal species of concern, and general biodiversity.
- **Policy 4.1**: Preserve and protect native and habitat-supporting plant resources throughout the City.
- **Policy 4.2**: Work with agencies, including the Orange County Flood Control District, to identify opportunities to enhance the natural qualities of Santiago Creek to protect habitat and reintroduce native plants and animals.
- **Policy 4.3**: Reduce the impact of urban development on important ecological and biological resources.
• **Policy 4.4:** Repair or improve ecological and biological conditions in the urban and natural environments when reviewing proposals for site development and redevelopment, as well as public improvements.

• **Policy 4.5:** Protect the Santiago Creek and Santa Ana River corridors from premature urbanization to ensure the continued availability of important sand and gravel, flood control, water recharge, biological, and open space resources.

**Tree Preservation Ordinance**

Orange Municipal Code Section 12.32.110 sets forth the Tree Preservation Ordinance, which requires applicants for subdivision maps or grading permits to identify the location of trees proposed for removal. If the City approves the subdivision map, or grading permit, City staff have the discretion to relieve the applicant of any necessity to apply for a separate permit for tree removal. City staff have the discretion to impose conditions on tree removal activities.

**3.4.4 - Methodology**

Descriptions and analysis in this section are based on the Biological Resources Assessment, Jurisdictional Delineation, and Tree Survey, which were all prepared by PCR Services. The reports are provided in Appendix C. Each report is summarized as follows:

**Biological Resources Assessment**

PCR prepared a Biological Resources Assessment that evaluated the potential presence of sensitive biological resources. The assessment was based on field reconnaissance and appropriate reference materials.

PCR first reviewed relevant literature on the biological resources of the project site and surrounding vicinity. CNDDDB, a CDFW species account database, was reviewed for all pertinent information regarding the localities of known observations of sensitive species and habitats in the vicinity of the project site. The vicinity of the project site includes the La Habra, Yorba Linda, and Prado Dam, Anaheim, Orange, Black Star Canyon, Newport Beach, Tustin, and El Toro topographic quadrangles. Federal register listings, protocols, and species data provided by USFWS and CDFW were reviewed in conjunction with anticipated Federally and State listed species potentially occurring within the vicinity. In addition, numerous regional flora and fauna field guides were utilized to assist in the identification of species and suitable habitats. Documentation of previous assessments and surveys conducted on the project site was also reviewed.

A general biological survey and vegetation mapping was conducted by PCR biologists Steve Nelson and Maile Tanaka on March 24, 2010 to document natural communities and existing conditions. Additional vegetation mapping was conducted within the off-site area by PCR biologist Maile Tanaka on September 26, 2012. The vegetation mapping was updated (for both on-site and off-site areas) on March 16 and April 21, 2017 by ESA biologists Maile Tanaka, Lauren Singleton, and Amy Lee. During the course of this survey, an inventory of all plant and wildlife species observed was compiled. Survey coverage of the entire project site, with special attention to sensitive habitats or those areas potentially supporting sensitive flora or fauna, was ensured using aerial photographs.
Because of the need for geotechnical slope stabilization and fuel modification measures, which are necessary to ensure the public safety of the future residents of the proposed development, the boundary of the off-site area was revised in September 2012. On September 26, 2012, vegetation mapping of the off-site area was conducted by PCR biologist Maile Tanaka; a jurisdictional delineation was conducted by PCR regulatory/environmental scientist Amir Morales and biologist Ezekiel Cooley; and a tree inventory was conducted by PCR biologists Bob Huttar (ISA certified), Ezekiel Cooley, and Maile Tanaka. No other focused surveys were conducted in the off-site area during the September 26, 2012 site visit. All subsequent general and focused surveys conducted in 2013, 2014, 2015, and 2017 encompassed the project boundary and the 2.01-acre off-site study area boundary.

Natural communities were mapped directly in the field utilizing a 250-scale (1”=250’) aerial photograph. Natural community names and descriptions follow the Orange County Habitat Classification System (OCHCS) (Gray and Bramlet 1992). After completing the fieldwork, the natural community polygons were digitized using Geographic Information System (GIS) technology to calculate acres.

All plant species observed during surveys were either identified in the field or collected and later identified using taxonomic keys. Plant taxonomy follows Hickman (1993). Common plant names, when not available from Hickman, were taken from Munz (1974) and McAuley (1996). Because common names vary significantly between references, scientific names are included upon initial mention of each species; common names consistent throughout the report are employed thereafter.

All wildlife species observed within the project site, as well as diagnostic sign (call, tracks, nests, scat, remains, or other sign), were recorded in field notes. Binoculars and regional field guides were utilized for the identification of wildlife, as necessary. Wildlife taxonomy follows Stebbins (2003) for amphibians and reptiles, the American Ornithologists’ Union (1998) for birds, and Jameson and Peeters (1988) for mammals. Scientific names are used during the first mention of a species; common names only are used in the remainder of the text.

Jurisdictional Delineation

A jurisdictional delineation of all existing on-site drainage features was conducted by PCR regulatory/environmental scientist Amir Morales and biologist Maile Tanaka on April 28 and May 23, 2011 and by Amir Morales and PCR biologist Ezekiel Cooley on September 26, 2012 to assess the extent of “waters of the U.S.”/“waters of the State” or wetlands under the jurisdiction of the USACE/RWQCB, or streambed and associated riparian habitat under the jurisdiction of the CDFW.

Tree Survey

In accordance with the City’s Municipal Code, Title 12 Streets and Sidewalks and Public Places, Chapter 12.32 Tree Preservation (Tree Preservation Ordinance), a tree survey was conducted by PCR biologists Maile Tanaka and Zeke Cooley and PCR affiliated biologists Joanna Nigro and Gerhard Bombe on April 9, 2010; by Joanna Nigro and Maile Tanaka on March 30, 2011; by Joanna Nigro on June 13, 2011; and by PCR biologists Bob Huttar, Ezekiel Cooley, and Maile Tanaka on September 26, 2012. Ms. Nigro, Mr. Bombe, and Mr. Huttar are International Society of Arboriculture (ISA) Certified Arborists.
The Tree Preservation Ordinance protects all trees, regardless of species, that measure a minimum of 10.5 inches in circumference, measured at a point 24 inches above the ground. The tree survey consisted of walking the portion of the project site within the project development footprint and off-site area (tree survey area), which comprised approximately 72.55 acres (71.10 acres on-site and 1.45 acre off-site), in order to locate all regulated trees meeting the size requirements as defined in the Tree Preservation Ordinance. PCR biologists visually assessed the size of each tree at 24 inches above ground to determine if they were subject to the requirements of the City’s Tree Preservation Ordinance; however, the diameter at breast height of each tree was recorded at 54 inches above ground in accordance with the ISA standard. Each tree was tagged and numbered then assessed according to ISA standards to include the diameter at breast height and height. Trees that could not be tagged either because they were inaccessible or because of duplicate tree numbering (trees of the same species close to each other that are individually numbered with sub-letters) were noted. Additionally, overall health as well as aesthetics and balance were given a rating based on the tree’s structure and presence of disease. The location of each tree was collected in the field using a Global Positioning System handheld unit. Following data collection, the digital information was uploaded and incorporated within PCR’s project-specific Geographic Information System database to provide a figure with specific tree locations within the project site.

3.4.5 - 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) Interferes 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?
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.

Special-status Plant Species

Impact BIO-1: The proposed project would not have a substantial adverse effect on special status plant species.

Impact Analysis

Implementation of the proposed project would result in the direct removal of existing vegetation. Two sensitive plant species were observed within the project site during focused sensitive plant surveys. These species are the southern California black walnut and southern tarplant.

Southern Tarplant

Based on the 2017 special-status plant survey, it is estimated that less than 100 southern tarplants occur on-site, and are located within the project’s development footprint (Exhibit 3.4-7). Impacts to less than 100 southern tarplants are not expected to threaten regional populations of this species, and in addition, the Conservation Measure applied to preserve southern tarplant by salvaging seed was already implemented in order to prevent loss of this local population due to current on-site activities related to existing backfilling and material recycling operations, which are not related to the proposed project. As such, impacts to southern tarplant associated with the implementation of the proposed project are considered less than significant and no mitigation measures would be required.

Southern California Black Walnut

A total of 71 southern California black walnuts occur within the southern cottonwood-willow riparian forest and non-native herbaceous cover communities within the northwestern portion of the project site. This area will be avoided by the proposed project; however, one walnut may potentially be impacted by the proposed project, as shown in Exhibit 3.4-7. However, the loss of one walnut tree, which is a CNPS Rank 4.2 species, from a population of 70 southern California black walnut trees that will be preserved and continue to reproduce and spread their seeds, is not considered a significant impact. Therefore, impacts to the southern California black walnuts are less than significant and no mitigation measures would be 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.
Exhibit 3.4-7
Impacts to Special-Status Plant Species

Source: PCR Consulting, 2011

CITY OF ORANGE • TRAILS AT SANTIAGO CREEK SPECIFIC PLAN
ENVIRONMENTAL IMPACT REPORT
Special-status Wildlife Species

Impact BIO-2: The proposed project may have a substantial adverse effect on special status wildlife species.

Impact Analysis
Implementation of the proposed project would result in the direct removal of existing habitat for wildlife species. Biological surveys for the project site indicated that sensitive wildlife species were observed or have at least a moderate potential to occur within the project site. Observed species include white-tailed kite, yellow-breasted chat, coastal California gnatcatcher, least Bell’s vireo, willow flycatcher, and coyote. Species with potential to occur on-site include arboreal salamander, coast range newt, coast patch-nosed snake, red-diamond rattlesnake, coast horned lizard, Coronado skink, orange throated whiptail, western mastiff bat, San Diego black-tailed jackrabbit, coastal whiptail, sharp-shinned hawk, rough-legged hawk, red-shouldered hawk, northern harrier, burrowing owl, Southern California rufous-crowned sparrow, prairie falcon, American peregrine falcon, loggerhead shrike, long-eared owl, southwestern willow flycatcher, pallid bat, northwestern San Diego pocket mouse, San Diego desert woodrat, and gray fox. Focused surveys were conducted for arroyo toad, burrowing owl, coastal California gnatcatcher, least Bell’s vireo, and southwestern willow flycatcher.

With the exception of coast patch-nosed snake, coast range newt, white-tailed kite, prairie falcon, burrowing owl, least Bell’s vireo, willow flycatcher, loggerhead shrike, yellow-breasted chat, long-eared owl, western mastiff bat, pallid bat, San Diego black-tailed jackrabbit, and northwestern San Diego pocket mouse, all the potentially present or observed species are covered species under the NCCP/HCP; therefore, impacts to these species, if present, are considered less than significant and adequately addressed through the implementation of the NCCP/HCP and no focused surveys or mitigation measures would be required. Prairie falcon and least Bell’s vireo are conditionally covered and are discussed in further detail below. Willow flycatcher is also discussed in further detail.

Coast patch-nosed snake, coast range newt, loggerhead shrike, yellow-breasted chat, long-eared owl, western mastiff bat, pallid bat, San Diego black-tailed jackrabbit, and northwestern San Diego pocket mouse are considered Species of Special Concern by the CDFW and do not carry a federal or state listing as threatened or endangered.

The proposed project was designed to minimize impacts to Santiago Creek and the northern portion of the project site (a total of 0.04 acre of permanent impacts on-site and 0.27 acre off-site, and 0.05 acre of temporary impacts on-site and 0.34 acre off-site, which will be restored to pre-project conditions, will occur to southern cottonwood-willow riparian forest for the installation of two storm drain outlets). The majority of the suitable habitat (e.g., southern cottonwood willow riparian forest, coastal sage scrub, and other native habitats) within Santiago Creek and northern portion of the project site which has potential to support special-status species will be avoided, and the availability of contiguous habitat within the project site will continue to provide resources and foraging habitat for these species, if present. Thus, the loss of individuals as a result of the proposed project would not be expected to reduce regional population numbers. Therefore, impacts to these sensitive wildlife species are considered adverse but less than significant and no mitigation measures would be required.
Sensitive wildlife species with potential to occur or which were observed on-site that are covered or conditionally covered by the NCCP/HCP include the arroyo toad, burrowing owl, coastal California gnatcatcher, prairie falcon, least Bell’s vireo, and southwestern willow flycatcher. A discussion of NCCP/HCP covered and conditionally covered species follows.

**Arroyo Toad (Federally Endangered, Species of Special Concern, NCCP/HCP Conditionally Covered)**
The arroyo toad is a conditionally covered species and requires additional mitigation measures be satisfied under the NCCP/HCP. The on-site habitat for this species is marginal, and no arroyo toad were observed on-site during focused surveys conducted by MBA in 2008 and PCR in 2010. Therefore, no impacts to the arroyo toad would occur and no mitigation measures would be required.

**Burrowing Owl (Species of Special Concern)**
The burrowing owl is a Species of Special Concern. Focused surveys were conducted for this species by PCR in 2012, 2013, 2014, and 2017. No burrowing owls were observed during focused survey and they are not expected to occur within the project site. Therefore, no impacts to the burrowing owl would occur and no mitigation measures would be required.

**Coastal California Gnatcatcher (Federally Threatened, NCCP/HCP Identified Species)**
The coastal California gnatcatcher is a covered species under the NCCP/HCP. No coastal California gnatcatcher were observed on-site during focused surveys conducted by MBA in 2008 and PCR in 2010, 2012, 2013, 2015, and ESA in 2017. However, during focused surveys conducted in 2014, a coastal California gnatcatcher pair was observed within the western portion of the project site on March 27, 2014. The pair did not appear to be engaged in any definite breeding-related activity and was not observed within the project site on subsequent surveys conducted during that season. However, what was believed to be the same pair was later observed off-site on May 2, 2014 on the west side of Cannon Street in a more extensive area of poor quality coastal sage scrub habitat.

In addition, an incidental sighting of one dispersing coastal California gnatcatcher was observed outside of the breeding season on August 3, 2010, and additional incidental sightings of two separate coastal California gnatcatcher individuals were observed on both June 9 and 27, 2017. The habitat where all of these incidental observations were seen was disturbed/non-native herbaceous cover or within disturbed areas perched on mule fat, and not coastal sage scrub. Because of the locations where these incidental sightings occurred, and since results of the focused breeding season surveys were negative in the years when each of these incidental sightings were made, it is believed these incidental sightings were likely juveniles dispersing through the project site from suitable habitat areas in the vicinity of the project site.

A number of coastal California gnatcatcher occurrences are documented in the USFWS occurrences database within the vicinity of the project site; these include 59 occurrences within a 1-mile radius. Thus, it is likely that the coastal California gnatcatchers observed on-site are foraging or dispersing through the project site from adjacent areas, particularly off-site areas downstream of the project site to the west. However, no breeding pairs were found within the project site during the 2008, 2010, 2012, 2013, 2014, 2015, or 2017 focused breeding season surveys. The coastal California gnatcatcher is a covered species with implementation of the NCCP/HCP, and although coastal California gnatcatcher individuals have been observed on-site (likely foraging or dispersing through
the project site), no breeding pairs have been found within the project site during focused breeding season surveys, and regardless, the proposed project will not impact any coastal sage scrub habitats. Furthermore, the proposed project will avoid the majority of Santiago Creek and its associated native riparian and upland habitats. Approximately 38 acres of the project site will be avoided, including 14.54 acres of sensitive plant communities, which includes 0.57 acre of coastal sage scrub (100 percent of extant on-site habitat) and 13.08 acres of southern cottonwood-willow riparian forest, within and/or adjacent to Santiago Creek. Although the incidental sightings of coastal California gnatcatcher were in disturbed/non-native herbaceous cover or within disturbed areas perched on mule fat, and not coastal sage scrub, if these areas were used for foraging and/or dispersal, the areas of Santiago Creek and native habitats that will be avoided by the proposed project north of the drainage will continue to provide higher quality habitat (including coastal sage scrub dominated by California sagebrush), which provide resources for foraging and connectivity to other open space areas for dispersal (e.g., to Santiago Oaks Regional Park to the east). As such, no significant impacts will occur to the coastal California gnatcatcher and no mitigation measures would be required.

In addition, the project site is not within critical habitat for this species; the nearest final critical habitat for coastal California gnatcatcher is 0.3 mile south of the project site. Therefore, no impacts will occur to the coastal California gnatcatcher critical habitat and no mitigation measures would be required.

Prairie Falcon (Species of Special Concern, NCCP/HCP Conditionally Covered)
The prairie falcon is a conditionally covered species and requires additional mitigation measures be satisfied under the NCCP/HCP. However, this species is only expected to utilize the project site for foraging. It is not anticipated that direct impacts to nesting sites would occur because of the lack of suitable nesting habitat within the project site. No active nests or nesting habitat for prairie falcon were identified within the project site or within one-half mile of the project site. The project site is surrounded by residential development and no known suitable nesting habitat (i.e., sheltered ledge of a cliff, bluff, or rock outcrop) exists within a 0.5-mile radius of the project site. Therefore, impacts to the prairie falcon foraging habitat would be considered less than significant and no mitigation measures would be required.

Least Bell’s Vireo (Federally and State Endangered, NCCP/HCP Conditionally Covered)
The least Bell’s vireo is a conditionally covered species under the NCCP/HCP. The least Bell’s vireo was previously observed on-site by MBA in 2008, PCR in 2010, and ESA in 2017. The proposed project would impact habitat supporting the least Bell’s vireo. A total of 0.10 acre of permanent impacts will occur to an isolated patch of southern cottonwood-willow riparian forest on-site; 0.04 acre of permanent impacts and 0.05 acre of temporary impacts will occur for the installation of an on-site storm drain outlet; and 0.27 acre of permanent impacts and 0.34 acre of temporary impacts will occur for off-site slope stabilization; refer to Exhibit 3.4-8.

Nine project design features serve to avoid or minimize impacts on the least Bell’s vireo, including:

- The proposed project will permanently retain approximately 38 acres of open space located on both sides of Santiago Creek and bordered on the north by Mabury Avenue.
The majority of the southern cottonwood-willow riparian forest within the project site will be avoided (13.08 acres), with the exception of 0.10 acre of permanent impacts that will occur to an isolated patch of southern cottonwood-willow riparian forest on-site, 0.04 acre of permanent impact and 0.05 acre of temporary impact from the installation of an on-site storm drain outlet, and 0.27 acre of permanent impact off-site and 0.34 acre of temporary impact for off-site geotechnical slope stabilization.

The proposed project will avoid the majority of Santiago Creek and its associated native riparian and upland habitats. Approximately 38 acres of the project site will be avoided, including 14.54 acres of sensitive plant communities, which includes 0.57 acre of coastal sage scrub and 13.08 acres of southern cottonwood-willow riparian forest, within and/or adjacent to Santiago Creek.

The proposed project will provide a 150-foot limited use (landscaping and fuel modification) time sensitive (breeding season March 15 through September 15) setback area adjacent to the southern cottonwood-willow riparian forest within Santiago Creek, which provides habitat for the least Bell’s vireo.

The proposed project will provide select landscaping, including native species, within the 150-foot limited use setback area (to the south of Santiago Creek) that is compatible with the adjacent open space area, its habitat, and is considerate of the fire protection (fuel modification) zone (refer to Exhibit 3.4-8).

The proposed project establishes development standards in the Specific Plan to reduce sensory stimuli (e.g., noise, light), unnatural predators (e.g., domestic cats and other non-native animals), and competitors (e.g., exotic plants, non-native animals).

Prior to building permit issuance, the proposed project will remove the existing fence on Orange County Flood Control District property.

The proposed project will restrict grading and/or construction activities within the 150-foot limited use setback area during the least Bell’s vireo breeding season; refer to Exhibit 3.4-8.

The proposed project will limit uses within the 150-foot limited use setback area to those as uses identified in the Specific Plan.

However, the least Bell’s vireo is a conditionally covered species under the NCCP/HCP.19. Any potential impacts to the least Bell’s vireo would be considered potentially significant. Mitigation Measures BIO-2a through BIO-2c are proposed to reduce impacts to a less than significant level.

Southwestern Willow Flycatcher (Federally and State Endangered, NCCP/HCP Conditionally Covered)
The southwestern willow flycatcher is a conditionally covered species and requires additional mitigation measures be satisfied under the NCCP/HCP. No southwestern willow flycatcher were observed on-site during focused surveys conducted by MBA in 2008 and PCR in 2010, 2012, 2013, 2014, and 2015, and ESA in 2017. Therefore, no impacts to the southwestern willow flycatcher would occur and no mitigation measures would be required.
**Willow Flycatcher (State Endangered)**

Willow flycatchers are listed as State Endangered and were observed during the 2012 survey. Two willow flycatchers were observed within the black willow scrub/ruderal community that borders the fallow field in the eastern portion of the project site. The habitat that these willow flycatchers were observed within is considered unsuitable as potential nesting habitat; therefore, it is assumed that both birds were migrants passing through the area, and are not the southwestern willow flycatcher subspecies. In addition, one willow flycatcher was observed within southern cottonwood-willow riparian forest within the north central portion of the project site. The habitat that this willow flycatcher was observed in is considered suitable for nesting; however, no breeding willow flycatchers were observed during the focused surveys. The proposed project would impact habitat suitable to support the willow flycatcher.

A total of 0.20 acre of permanent impacts will occur to non-native herbaceous cover/black willow scrub, and a total of 0.10 acre of permanent impacts will occur to an isolated patch of southern cottonwood-willow riparian forest on-site, 0.04 acre of permanent impacts and 0.05 acre of temporary impacts will occur to southern cottonwood-willow riparian forest for the installation of an on-site storm drain outlet, as well as 0.27 acre of permanent impact and 0.34 acre of temporary impacts to southern cottonwood-willow riparian forest for off-site geotechnical slope stabilization. However, because willow flycatchers are not expected to breed within the off-site area, no direct impacts would occur to this species and no mitigation measures would be required. Significant impacts to foraging habitat for this species are not anticipated, as discussed below.

Although the black willow scrub/ruderal will be permanently removed, this isolated stand of willows provides only a small, limited amount of foraging habitat for this species. The riparian habitat within Santiago Creek that will be avoided by the proposed project will still be available to provide a greater area of contiguous habitat for foraging opportunities.

For the southern cottonwood-willow riparian forest that will be impacted with the installation of two storm drain outlets, temporary impacts will be restored to pre-project conditions. The 0.10 acre of permanent impacts for an isolated patch of southern cottonwood willow riparian forest on-site, 0.04 acre of permanent impacts where the on-site storm drain outlet will be installed, and 0.27 acre of permanent impact for off-site slope stabilization will be mitigated for at an on- and/or off-site location. Additionally, the storm drain outlet structures are not expected to exclude continued use of the surrounding habitat for foraging should willow flycatcher occur within these areas.

Thus, impacts to potential willow flycatcher foraging habitat are not expected to threaten regional populations of this species and would be considered less than significant, and no mitigation measures would be required.

**White-tailed Kite (Fully Protected)**

White-tailed kite was observed within the on-site portion of the project site during 2008 surveys. In addition, this species has the potential to breed within the project site. Any potential impacts to the white-tailed kite would be considered potentially significant. Therefore, mitigation to avoid any nesting birds during the breeding season would be required in compliance with the California Fish
and Game Code (Sections 3503.5 and 3511) and Migratory Bird Treaty Act (16 U.S.C. 703, et seq. [see Mitigation Measure BIO-2d]).

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM BIO-2a**

Prior to the issuance of any grading permit for areas supporting least Bell’s vireo habitat (such as southern cottonwood-willow riparian forest), the project applicant shall obtain federal and state take authorizations via regulatory permits (such as a CWA Section 404 permit issued by the USACE), which will require that the U.S. Fish and Wildlife Service (USFWS) be consulted as provided for by Section 7 of the FESA (for the federally listed least Bell’s vireo). The federal regulatory permits (such as CWA Section 404 permit issued by the USACE) provide a “federal nexus” by which Section 7 consultation can occur. This statute imposes the obligation on federal agencies to ensure that their actions (such as issuing federal CWA permits for this project) are not likely to jeopardize the continued existence of a listed species or destroy or adversely modify its designated critical habitat. This obligation is enforced through the procedural requirement that agencies such as the United States Army Corps of Engineers initiate consultation with the USFWS on any actions that may affect a threatened or endangered species. During the FESA Section 7 consultation anticipated for this project, the USFWS will gather all relevant information concerning the proposed project and the potential project-related impacts on the least Bell’s vireo (i.e., the project applicant will submit a species-specific Biological Assessment), prepare its opinion with respect to whether the project is likely to jeopardize the continued existence of the species (i.e., the USFWS will issue a Biological Opinion), and recommend mitigation/conservation measures where appropriate. Additionally, the need for State regulatory permits (i.e., Fish and Game Code Section 1602 Streambed Alteration Agreement issued by the CDFW) will require a Consistency Determination from the CDFW for the State-listed least Bell’s vireo under CESA.

In addition, the following best management practices (BMPs) will ensure that indirect impacts will not occur to the least Bell’s vireo within 300 feet of occupied habitat as monitored by a certified biologist:

1. Construction limits in and around least Bell’s vireo potential habitat shall be delineated with flags and fencing prior to the initiation of any grading or construction activities.
2. Prior to grading and construction a training program shall be developed and implemented to inform all workers on the project about listed species, sensitive habitats, and the importance of complying with avoidance and minimization measures.
3. All construction work shall occur during the daylight hours. The construction contractor shall limit all construction-related activities that would result in high noise levels according to the construction hours determined by the City.

4. During all excavation and grading on-site, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers’ standards to reduce construction equipment noise to the maximum extent possible. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from sensitive receptors (i.e., least Bell’s vireo territory within Santiago Creek) nearest the project site.

5. The construction contractor shall stage equipment in areas that will create the greatest distance between construction-related noise sources and noise sensitive receptors nearest the project site during all project construction.

6. Noise from construction activities shall be limited to the extent possible through the maximum use of technology available to reduce construction equipment noise. Project-generated noise, both during construction and after the development has been completed, shall be in compliance with the requirements outlined in the City of Orange General Plan Noise Element to ensure that noise levels to which the riparian area is exposed do not exceed noise standards for residential areas.

7. The project shall be designed to minimize exterior night lighting while remaining compliant with City of Orange ordinances related to street lighting. Any necessary lighting (e.g., to light up equipment for security measures), both during construction and after the development has been completed, will be shielded or directed away from Santiago Creek and are not to exceed 0.5 foot-candles. Monitoring by a qualified lighting engineer (attained by the project applicant and subject to spot checking by City Staff) shall be conducted as needed to verify light levels are below 0.5 foot-candles required within identified, occupied least Bell’s vireo territories, both during construction and at the onset of operations. If the 0.5 foot-candles requirement is exceeded, the lighting engineer shall make operational changes or install a barrier to alleviate light levels during the breeding season.

8. Two brown-headed cowbird traps shall be installed and maintained within the general vicinity of the habitat for five years.

**MM BIO-2b**

The following shall be incorporated into the Biological Assessment as proposed mitigation for potential impacts to least Bell’s vireo, subject to USFWS and CDFW approval:

1. On- or off-site restoration or enhancement of least Bell’s vireo habitat at a ratio no less than 3:1 for permanent grading impacts. Off-site restoration or enhancement may include the purchase of mitigation credits at an agency-approved off-site mitigation bank supporting least Bell’s vireo.
All construction, grading, and fuel modification activities (i.e., thinning) shall take place outside of the least Bell’s vireo breeding season (March 15 to September 15) to the greatest extent feasible. If any construction, grading, and fuel modification activities are required during the breeding season within 300 feet of potential least Bell’s vireo habitat, and pre-construction surveys determine least Bell’s vireo are present, activities may continue in the presence of a biological monitor who will confirm that no work will occur within a 300-foot buffer of least Bell’s vireo, and that any least Bell’s vireo are not being disturbed by project activities. If any disturbance to the least Bell’s vireo is detected by the biological monitor, the buffer will be increased, other disturbance minimizing measures may be implemented (e.g., visual and/or noise barrier), and/or work will cease as recommended by the monitor.

Additional measures to be taken for all construction activities within 300 feet of potential least Bell’s vireo habitat during the breeding season (March 15 to September 15):

1. Pre-construction surveys shall be conducted within 1 week prior to initiation of construction activities and all results forwarded to the USFWS and CDFW. Focused surveys shall be conducted for least Bell’s vireo during construction activities.
2. If at any time least Bell’s vireo are found to occur within 300 feet of construction areas, the monitoring biologist shall inform the appropriate construction supervisor to cease such work and shall consult with the USFWS and CDFW to determine if work shall commence or proceed during the breeding season and, if work may proceed, what specific measures shall be taken to ensure least Bell’s vireos are not affected.
3. Installation of any noise barriers and any other corrective actions taken to mitigate noise during the construction period shall be communicated to the USFWS and CDFW.

Prior to the issuance of any grading permit that would remove habitat containing raptor and songbird nests, the project applicant shall demonstrate to the satisfaction of the City that either of the following have been or will be accomplished.

1. Vegetation removal activities shall be scheduled outside the nesting season (September 1 to February 14 for songbirds; September 1 to January 14 for raptors) to avoid potential impacts to nesting birds.
2. Any construction activities that occur during the nesting season (February 15 to August 31 for songbirds; January 15 to August 31 for raptors) will require that all suitable habitat be thoroughly surveyed for the presence of nesting birds by a qualified biologist before commencement of clearing. If any active nests are detected, a buffer of at least 300 feet (500 feet for raptors) will be delineated, flagged, and avoided until the nesting cycle is complete, or as determined appropriate by the biological monitor, to minimize impacts.
Level of Significance After Mitigation

Less than significant impact.

Sensitive Natural Communities

Impact BIO-3: The project may impact sensitive natural communities.

Impact Analysis

Implementation of the proposed project would result in impacts to coast live oak woodland, mule fat scrub, open water, ornamental, eucalyptus woodland, non-native grassland/non-native herbaceous cover, non-native grassland/disturbed, non-native herbaceous cover, non-native herbaceous cover/black willow scrub, non-native herbaceous cover/mule fat scrub, non-native herbaceous cover/disturbed, disturbed, disturbed/arrowo willow scrub, disturbed/black willow scrub, disturbed/mule fat scrub, disturbed/non-native herbaceous cover, and developed, as summarized in Table 3.4-3. None of these natural communities represent sensitive natural communities (CDFW 2003) and their removal does not meet the significance thresholds defined previously. Therefore, impacts to these natural communities would be considered a less than significant impact and no mitigation measures would be required.

Table 3.4-3: Impacts to Natural Communities

<table>
<thead>
<tr>
<th>Natural Community</th>
<th>Existing</th>
<th>Permanent Impacts</th>
<th>Fuel Modification</th>
<th>Temporary Impacts</th>
<th>Avoided</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>On-site</td>
<td>Off-site</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Southern Cottonwood—Willow Riparian Forest</td>
<td>12.79</td>
<td>1.09</td>
<td>13.88</td>
<td>0.14 (0.27)</td>
<td>0.05 (0.34)</td>
</tr>
<tr>
<td>Coastal Sage Scrub</td>
<td>0.57</td>
<td>—</td>
<td>0.57</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Coastal Sage Scrub/Non-Native Herbaceous Cover</td>
<td>0.19</td>
<td>—</td>
<td>0.19</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Coast Live Oak Woodland</td>
<td>0.33</td>
<td>—</td>
<td>0.33</td>
<td>0.33 (0.13)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Blue Elderberry Scrub</td>
<td>0.13</td>
<td>—</td>
<td>0.13</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>California Brittlebush Scrub</td>
<td>0.26</td>
<td>—</td>
<td>0.26</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Laurel Sumac Scrub</td>
<td>0.38</td>
<td>—</td>
<td>0.38</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Yerba Santa Scrub</td>
<td>0.31</td>
<td>—</td>
<td>0.31</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Mule Fat Scrub</td>
<td>0.17</td>
<td>—</td>
<td>0.17</td>
<td>0.09</td>
<td>—</td>
</tr>
<tr>
<td>Open Water</td>
<td>0.66</td>
<td>—</td>
<td>0.66</td>
<td>0.66</td>
<td>—</td>
</tr>
<tr>
<td>Giant Reed</td>
<td>0.44</td>
<td>—</td>
<td>0.44</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Ornamental</td>
<td>0.49</td>
<td>—</td>
<td>0.49</td>
<td>0.13</td>
<td>0.04</td>
</tr>
<tr>
<td>Eucalyptus Woodland</td>
<td>0.43</td>
<td>—</td>
<td>0.43</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>
### Table 3.4-3 (cont.): Impacts to Natural Communities

<table>
<thead>
<tr>
<th>Natural Community</th>
<th>Acres</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>On-site</td>
<td>Off-site</td>
<td>Total</td>
<td>Permanent Impacts</td>
<td>Fuel Modification</td>
<td>Temporary Impacts</td>
</tr>
<tr>
<td>Non-Native Grassland/Non-Native Herbaceous Cover</td>
<td>25.47</td>
<td>0.65</td>
<td>26.12</td>
<td>13.06 (0.65)</td>
<td>0.30</td>
<td>(&lt;0.01)</td>
</tr>
<tr>
<td>Non-Native Grassland/Disturbed</td>
<td>3.89</td>
<td>—</td>
<td>3.89</td>
<td>3.75</td>
<td>—</td>
<td>0.03</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover</td>
<td>5.11</td>
<td>—</td>
<td>5.11</td>
<td>3.46</td>
<td>0.28</td>
<td>—</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Black Willow Scrub</td>
<td>0.20</td>
<td>—</td>
<td>0.20</td>
<td>0.20</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Coastal Sage Scrub</td>
<td>0.43</td>
<td>—</td>
<td>0.43</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Mule Fat Scrub</td>
<td>0.26</td>
<td>—</td>
<td>0.26</td>
<td>0.26</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Ornamental</td>
<td>7.05</td>
<td>—</td>
<td>7.05</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Non-Native Herbaceous Cover/Disturbed</td>
<td>0.19</td>
<td>—</td>
<td>0.19</td>
<td>0.03</td>
<td>0.13</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed</td>
<td>19.46</td>
<td>—</td>
<td>19.46</td>
<td>17.92</td>
<td>0.51</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed/Arroyo Willow Scrub</td>
<td>0.11</td>
<td>—</td>
<td>0.11</td>
<td>0.11</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed/Black Willow Scrub</td>
<td>0.31</td>
<td>—</td>
<td>0.31</td>
<td>0.31</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed/Coastal Sage Scrub</td>
<td>0.30</td>
<td>—</td>
<td>0.30</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed/Mule Fat Scrub</td>
<td>0.03</td>
<td>—</td>
<td>0.03</td>
<td>0.03</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Disturbed/Non-Native Herbaceous Cover</td>
<td>26.22</td>
<td>—</td>
<td>26.22</td>
<td>25.46</td>
<td>0.08</td>
<td>—</td>
</tr>
<tr>
<td>Developed</td>
<td>3.57</td>
<td>—</td>
<td>3.57</td>
<td>3.31</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>109.75</strong></td>
<td><strong>2.01</strong></td>
<td><strong>111.76</strong></td>
<td><strong>69.68 (1.05)</strong></td>
<td><strong>1.34</strong></td>
<td><strong>0.08 (0.40)</strong></td>
</tr>
</tbody>
</table>


The project site supports 0.76 acre of coastal sage scrub (0.57 acre of coastal sage scrub, 0.19 acre of coastal sage scrub/non-native herbaceous cover). The project will avoid impacts to coastal sage scrub, which is a natural community covered under the NCCP; therefore, no impacts would occur to the coastal sage scrub community, as shown in Exhibit 3.4-9.
Exhibit 3.4-9
Impacts to Sensitive Natural Communities

Source: PCR Consulting, 2011
Four sensitive communities that are considered high priority for conservation by the CDFW’s List of California Terrestrial Natural Communities, include southern cottonwood-willow riparian forest (13.88 acres; 12.79 acres on-site and 1.09 acres off-site), blue elderberry scrub (0.13 acre on-site), California brittlebush scrub (0.26 acre on-site), and yerba santa scrub (0.31 acre on-site). Blue elderberry scrub, California brittlebush scrub, and yerba santa scrub will be avoided by the project. The proposed project will impact southern cottonwood-willow riparian forest, including 0.10 acre of on-site permanent impacts within the limits of grading; 0.04 acre of permanent impacts and 0.05 acre of temporary impacts, due to installation of an on-site storm drain outlet; and 0.27 acre permanent impacts and 0.34 acre temporary impacts for off-site slope stabilization. Any impacts to sensitive communities (e.g., southern cottonwood-willow riparian forest) would be considered potentially significant. The measures outlined in Mitigation Measure BIO-3 would reduce impacts to a less than significant level.

**Level of Significance Before Mitigation**
Potentially significant impact

**Mitigation Measures**

**MM BIO-3**

Prior to the issuance of any grading permit in the areas designated as sensitive riparian communities (e.g., southern cottonwood-willow riparian forest or black willow scrub/ruderal), the project applicant shall demonstrate to the satisfaction of the City that either of the following have been or will be accomplished:

On- or off-site restoration or enhancement of sensitive riparian communities (e.g., southern cottonwood-willow riparian forest) at a ratio no less than 1:1 for permanent impacts. Temporary impacts will be restored to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 1:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., Santa Ana Watershed Association [SAWA]).

If mitigation is to occur on-site and/or off-site (i.e., not an in-lieu fee program), a mitigation and monitoring plan shall be prepared. The plan shall focus on the creation of equivalent habitats within disturbed habitat areas of the project site and/or off-site. In addition, the plan shall provide details as to the implementation of the plan, maintenance, and future monitoring. Mitigation for impacts to sensitive riparian communities shall be accomplished by on- or off-site restoration and/or enhancement (e.g., transplantation, seeding, and/or planting/staking of sensitive riparian species; salvage/dispersal of duff and seed bank; removal of large stands of giant reed within riparian areas).

**Level of Significance After Mitigation**
Less than significant impact.
**Wetlands**

**Impact BIO-4:** The proposed project may impact federally protected wetlands.

**Impact Analysis**

The proposed project would result in impacts to approximately 615 linear feet (187 linear feet permanent, 428 linear feet temporary) and 0.12 acre (0.03 acre permanent on- and off-site and 0.09 acre temporary on-site) of USACE/RWQCB “waters of the U.S.”/“waters of the State,” of which 0.05 acre is wetland (less than 0.01 acre permanent on-site, 0.05 acre temporary off-site), as well as 0.28 acre (0.08 acre permanent on- and off-site, and 0.20 acre temporary on- and off-site) of CDFW jurisdictional streambed and associated riparian habitat; refer to Exhibit 3.4-10. Any potential impacts to jurisdictional waters are considered potentially significant. Implementation of Mitigation Measure BIO-4 would reduce impacts to a less than significant level.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM BIO-4**

Prior to the issuance of any grading permit for permanent impacts in the areas designated as jurisdictional features, the project applicant shall obtain a CWA Section 404 permit from the USACE, a CWA Section 401 permit from the RWQCB, and Streambed Alteration Agreement permit under Section 1602 of the California Fish and Game Code from the CDFW. The following would be incorporated into the permitting, subject to approval by the regulatory agencies:

1. On- or off-site restoration or replacement of USACE/RWQCB jurisdictional waters of the U.S/waters of the State at a ratio no less than 2:1 for permanent impacts, and for temporary impacts, restore impact area to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 2:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., SAWA).

2. On- or off-site restoration or enhancement of CDFW jurisdictional streambed and associated riparian habitat at a ratio no less than 2:1 for permanent impacts, and for temporary impacts, restore impact area to pre-project conditions (i.e., pre-project contours and revegetate with native species, where appropriate). Off-site restoration or enhancement at a ratio no less than 2:1 may include the purchase of mitigation credits at an agency-approved off-site mitigation bank or in-lieu fee program (e.g., SAWA).

**Level of Significance After Mitigation**

Less than significant impact.
Exhibit 3.4-10
Impacts to Jurisdictional Features

Source: PCR Consulting, 2011
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Fish and Wildlife Movement

Impact BIO-5: The project would not interfere with fish or wildlife movement.

Impact Analysis

The Santiago Creek corridor supports live-in and movement habitat for species on a local scale and also likely functions to facilitate wildlife movement for a number of species on a regional scale. The proposed project was designed to avoid Santiago Creek and associated native habitat that is best suited to support local and regional wildlife movement along the creek to the maximum extent feasible.

The proposed project was designed to avoid Santiago Creek and associated native habitat that is best suited to support local and regional wildlife movement along the creek to the maximum extent feasible in the following ways:

- The proposed project will permanently retain approximately 38 acres of open space located on both sides of Santiago Creek and bordered on the north by Mabury Avenue.
- The majority of the southern cottonwood-willow riparian forest within the project site will be avoided (i.e., 13.08 acres), with the exception of 0.10 acre of permanent impacts will occur to an isolated patch of southern cottonwood-willow riparian forest on-site, 0.04 acre of permanent impact and 0.05 acre of temporary impact from the installation of an on-site storm drain outlet, and 0.27 acre of permanent impact off-site and 0.34 acre of temporary impact for off-site geotechnical slope stabilization.
- The proposed project will avoid the majority of Santiago Creek and its associated native riparian and upland habitats. Approximately 38 acres of the project site will be avoided, including 14.54 acres of sensitive plant communities, which includes 0.57 acre of coastal sage scrub and 13.08 acres of southern cottonwood-willow riparian forest, within and/or adjacent to Santiago Creek. A total of 0.04 acre of permanent impacts on-site and 0.27 acre off-site, and 0.05 acre of temporary impacts on-site and 0.34 acre off-site, which will be restored to pre-project conditions, will occur to southern cottonwood-willow riparian forest for the installation of two storm drain outlets.
- The proposed project will provide a 150-foot limited use (landscaping and fuel modification) time sensitive (breeding season March 15 through September 15) setback area adjacent to the southern cottonwood-willow riparian forest within Santiago Creek, which provides habitat for the least Bell’s vireo.
- The proposed project will provide select landscaping, including native species, within the 150-foot limited use setback area (to the south of Santiago Creek) that is compatible with the adjacent open space area, its habitat, and is considerate of the fire protection (fuel modification) zone (refer to Exhibit 3.4-8).
- The proposed project establishes development standards in the Specific Plan to reduce sensory stimuli (e.g., noise, light), unnatural predators (e.g., domestic cats and other non-native animals), and competitors (e.g., exotic plants, non-native animals).
- Prior to building permit issuance, the proposed project will remove the existing fence on Orange County Flood Control District property.
The proposed project will restrict grading and/or construction activities within the 150-foot limited use setback area during the least Bell’s vireo breeding season; refer to Exhibit 3.4-8.

The proposed project will limit uses within the 150-foot limited use setback area to those as uses identified in the Specific Plan.

Santiago Creek within the project site does not support fish passage because of downstream obstructions including the presence of Santiago Creek Recharge Basin.

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.

**Local Biological Ordinances and Policies**

**Impact BIO-6:** The project would not conflict with local biological ordinances or policies.

**Impact Analysis**

The project site contains 323 trees within the tree survey area, of which 256 are within the project development footprint and 67 would be avoided. Of the 256 trees that will be impacted, 204 trees are located on-site and 52 are located off-site. Exhibit 3.4-11 depicts impacts to regulated tree species. Of the 204 trees on-site that will be impacted within the 71.10-acre development footprint, nine trees are within the fuel modification beyond the limits of grading so may potentially be left in place but are subject to thinning, and two trees are within the 0.06-acre storm drain outlet footprint and one tree is within the 0.08-acre associated temporary 30-foot construction buffer. Of the 52 trees within the 2.01-acre off-site area that will be impacted, 27 trees will be removed for permanent impacts and 25 trees may be removed for temporary impacts due to slope stabilization.

The Tree Preservation Ordinance requires applicants for subdivision maps or grading permits to identify the location of trees proposed for removal and affords City staff discretion in imposing conditions on tree removal activities and replanting. Removed trees would be conditioned on being replaced on-site at no less than a 1:1 ratio. Impacts would be less than significant.

**Level of Significance Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is necessary.
Exhibit 3.4-11
Impacts to Regulated Trees

Source: PCR Consulting, 2011
Level of Significance After Mitigation
Less than significant impact.

Conservation Plan Consistency

| Impact BIO-7: | The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan |

Impact Analysis
The project site is within the boundaries of the Orange County Central and Coastal Subregion NCCP/HCP. The NCCP/HCP has an objective of assembling a 38,000-acre preserve in Orange County consisting of the highest value biological habitat.

Within the project site, the Santiago Creek corridor contain riparian habitat and the upland areas north of the creek contain marginal coastal sage scrub habitat, which are considered to have high biological value. These areas are contemplated to be preserved as open space and, therefore, would be available for inclusion in the preserve. Additionally, the 4.2 acres proposed for residential development coincide with the surface mining areas and do not contain any significant biological habitat. For these reasons, no conflicts with the NCCP/HCP would occur. 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.
3.5 - Cultural Resources

3.5.1 - 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 the Addendum to the Phase I Cultural Resources Assessment prepared by BCR Consulting, the Updated Native American Consultation for the Rio Santiago Specific Plan Project prepared by BCR Consulting, and the Phase I Cultural Resources Assessment and Paleontological Records Review prepared by Michael Brandman Associates. These reports are provided in Appendix D. In November and December of 2017, the archaeological and paleontological records searches were updated and a new pedestrian survey was conducted for the property. The results of these efforts are contained herein.

3.5.2 - 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

**Prehistory**

The ultimate purpose of establishing a cultural sequence is to allow for the meaningful comparison of material culture attributes on an intra- and inter-site basis, and to provide the basis for culture-model building. To this end, regional archaeologists generally follow Wallace’s Southern California Format (1955 and 1978) for discussing the prehistoric chronology for the project area. However, the established chronologies are often augmented or even abandoned. For example, Fagan (2003) does not use the traditional archaeological cultural sequences for his regional analysis, instead he described the stages as generalized models related to recent environmental change and socio-economic models, all associated with an ever-changing environment. Thusly, it should be noted that all of the presented cultural sequences are regularly challenged, as are the meanings of the individual frames of reference. Wallace’s prehistoric format is as follows:

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1 Michael Brandman Associates became part of FirstCarbon Solutions (FCS) in 2012; this section refers to Michael Brandman Associates (MBA) and FCS interchangeably.
• Early Period (before 6000 B.C.)
• Milling Stone (6000 to 3000 B.C.)
• Intermediate (3000 B.C. to A.D. 500)
• Late Prehistoric (A.D. 500 to A.D. 1769).

Wallace also argued (Wallace, in Heizer 1978) that the stages prior to 2000 B.C. in southern California could be assigned to:

• San Dieguito Period (Period I: 9000 to 6000 B.C.)
• Standard Millingstone Period (Period II: 6000 to 3000 B.C.)
• Modifies Millingstone Period (Period III: 3000 to 2000 B.C.).

Warren (1968) uses the following terms to subdivide the periods:

• San Dieguito Tradition (Before 5500 B.C.)
• Encinitas Tradition (5500 B.C. to A.D. 600)
• Shoshonean Tradition (A.D. 600 to A.D. 1769)

The Late Period has been further subdivided into the San Luis Rey I (A.D. 500 to A.D. 1500) and the San Luis Rey II (post 1500). The difference between the latter two is the introduction of locally made brownware pottery, the first indigenous pottery in southern California (Cameron 1999).

Early Period (before 6000 B.C.)
Beginning with the first human presence in California, prehistoric artifacts and cultural activities appear to represent a big-game hunting tradition. Very few sites from the Early Period exist, especially in inland areas. Of the Early Period sites that have been excavated and dated, most exhibit a refuse assemblage suggesting short-term occupation. Such sites have been detected in caves and around fluvial lakes fed by streams that existed near the end of the last glaciation. Chipped stone tools at these sites are surmised to reflect a specialized tool kit used by hunters. Large-stemmed bifaces are common. Millingstones and dart points are not part of the Early Period tool assemblage.

Millingstone Period (6000 to 3000 B.C.)
The onset of the Millingstone Period appears to correspond with an interval of warm and dry weather known as the Altithermal (Wallace 1978). Artifact assemblages begin to reflect an emphasis on plant foods and foraging subsistence systems, as evidenced by the grinding tools found at these sites, and including choppers and scraper planes. Notably, there is a reduced number of large bifaces in the excavated assemblages. Sites are occupied for a greater duration than Early Period sites, based on an increase in occupational debris. Although numerous Millingstone sites have been identified in Orange County, few are actually dated. The best understood of these is CA-ORA-64, which has been radiometrically dated to about 6000 B.C. (Breece et al. 1988 and 1989). Excavations at this site located near Newport Bay, have been essential to the formulation of local research models (Koerper 1981). Research at this site suggests a settlement-subsistence system during the Millingstone Period reflecting a semi-sedentary lifestyle. The regional distribution of Millingstone sites reflects the theory that aboriginal groups may have followed a modified central-based wandering settlement pattern. Under this model, large groups would have occupied a base camp for
a portion of the year, with smaller bands occupying subsidiary camps in order to exploit resources not generally available near the base camp. Sedentism apparently increased in areas possessing an abundance of resources that were available for longer periods. Arid inland regions would have provided a seasonally and spatially dispersed resource base, restricting sedentary occupation, compared to the coastal areas. Generally, the Millingstone assemblage in the Los Angeles basin is typified by large and heavy deep-basin metates, wedge-shaped manos and large choppers and scrapers. Flaked lithic tools are slightly larger and cruder than in later periods, and cogstones begin to appear.

**Intermediate Period (3000 B.C. to A.D. 500)**

Dating between roughly 3000 B.C. and A.D. 500, the Intermediate Period represents a slow technological transition, which is presumably related to the slowly drying and warming climate. Site artifact assemblages retain many attributes of the Millingstone Period. Technologically speaking, these sites are difficult to distinguish from earlier sites in the absence of radiometric dates.

Additionally, these sites generally contain a reduced number of large-stemmed or notched projectile points but with an increase in portable mortars and pestles. The lack of large points combined with the mortars and pestles suggest that the indigenous populations may have preferred harvesting, processing, and consuming acorns and other seeds over hunting. Due to a general lack of data, neither the settlement and subsistence systems nor the cultural evolution of this period are well understood. It has been proposed by some researchers that group sedentarism increased with the exploitation of storable, high-yield plant food resources such as acorns. The duration and intensity of occupation at base camps increased during this period, especially in the later part of the period.

Generally, the Intermediate Period artifact assemblage in the Los Angeles basin is vague, including elements of the Late Prehistoric Period and Millingstone Period, such as heavy grinding implements.

A higher percentage of projectile points occur and smaller chipped stone tools are used.

**Late Prehistoric Period (A.D. 500 to A.D. 1769)**

Extending from about A.D. 500 to Spanish contact in A.D. 1769, the Late Prehistoric Period reflects an increased sophistication and diversity in technology. Village sites are common. Late assemblages characteristically contain small projectile or dart points, which imply the use of the bow and arrow.

In addition, assemblages include steatite bowls, asphaltum artifacts, grave goods, and elaborate shell ornaments. Use of bedrock milling stations is purported to have been widespread during this period, as it was in the previous period. Increased hunting efficiency and widespread exploitation of acorns provided reliable and storable food resources. Pottery, previously traded into the area, is made locally during the latest stage of this Period and is of simple construction technology. Cameron (1999) names several village sites in inland Orange County that are located within Gabrieliño territory. These exhibited pottery, which suggests that the pre-contact Gabrieliño may have used pottery as a part of their lifestyle. One of these Late Prehistoric Period sites, Tomato Springs (CA-ORA-244), has been the subject of numerous excavations (Cottrell 1985) that have continued into the 21st century.
Native American Background

The project area is situated within an area that has been ethnographically mapped as the Gabrieliño traditional use area. The Gabrieliño tribal territory is mapped as extending north from Aliso Creek to just beyond the Topanga Canyon along the Pacific Coast, and inland to the City of San Bernardino (Bean and Smith 1978). Their territory would have included portions of the Santa Ana River, and several islands, and diffusion of ideas between neighboring groups, such as the Juaneño to the south.

The Gabrieliño

Kroeber (1925) and Bean and Smith (1978) form the primary historical references for this tribal group. The arrival of Spanish explorers and the establishment of missions and outposts during the eighteenth century ended the prehistoric period in California. At this time, traditional Gabrieliño society began to fragment as a result of foreign diseases and the mass removal of local Indian groups to the Mission San Gabriel and Mission San Juan Capistrano. The Gabrieliño spoke a language that belongs to the Cupan group of the Takic subfamily of the Uto-Aztecan language family (a language family that includes the Shoshonean groups of the Great Basin). The total Gabrieliño population in about 1770 AD was roughly 5,000 persons, based on an estimate of 100 small villages, with approximately 50 to 200 people per village. Their range is generally thought to have been located along the Pacific coast from Malibu to San Pedro Bay, south to Aliso Creek, then east to Temescal Canyon, then north to the headwaters of the San Gabriel River. Also included were several islands, including Catalina. This large area encompasses the City of Los Angeles, much of Rancho Cucamonga, Corona, Glendale, and Long Beach. By 1800, most traditional Gabrieliños had either been killed, or subjugated by the Spanish. The first modern social analyses of Gabrieliño culture took place in the early part of the twentieth century (Kroeber 1925). By this time, acculturation and disease had devastated this group, and the population studied was a remnant of their pre-contact form. Nonetheless, the early ethnographers viewed the Gabrieliño as a chief-oriented society of semi-sedentary hunter-gatherers. Influenced by coastal and interior environmental settings, their material culture was quite elaborate and consisted of well-made wood, bone, stone, and shell items. Included among these was a hunting stick made to bring down numerous types of game. Located in an area of extreme environmental diversity, large villages may have been permanent, such as that found on or near Red Hill in Rancho Cucamonga, with satellite villages utilized seasonally. Their living structures were large, domed, and circular thatched rooms that may have housed multiple families. The society exhibited ranked individuals, possibly chiefs, who possessed a much higher level of economic power than unranked persons.

Historic Background

City of Orange

The earliest European explorers to enter the Alta California region were the Spanish who navigated along the Pacific coast during the 17th and 18th centuries. During the latter portion of the 18th century, the Spanish sent Father Junipero Serra to Alta California to create a chain of Missions and Mission outposts to bring Christianity to the indigenous population, and create a foundation for colonization of the region. Between 1769 and 1823, Spanish explorers and missionaries established 21 missions, four presidios, and four pueblos between San Diego and Sonoma. Also during this period, American explorations occurred when trappers traveled west in search of abundant sea otter and beaver pelts. In 1805, when Lewis and Clark crossed the Rocky Mountains and continued on to the Pacific coast, they reported that the area was richer in beaver and otter than any other country
on earth. The fur trappers were close behind the explorers, and by 1840, the beaver was over-exploited and was no longer worth hunting (Bean and Rawls 1983).

By the early decades of the 19th century, the Missions began establishing ranchos for the purpose of expanding their agricultural holdings. According to the history provided on the City of Orange website, the first landowner in this area was a retired Spanish soldier named Juan Pablo Grijalva. Grijalva was granted permission to ranch “the place of the Arroyo de Santiago” by the Spanish colonial government in 1801. This land ran from the Santa Ana River and the foothills above Villa Park, to the sea at Newport Beach. Though Grijalva lived in San Diego, he built an adobe ranch house on what is now Hoyt Hill, at the corner of Hewes and Santiago Canyon Road (City of Orange History 2008).

Following Grijalva’s death, the rancho was taken over by his son-in-law, Jose Antonio Yorba, and grandson, Juan Pablo Peralta. These lands then became known as the Rancho Santiago de Santa Ana, and were granted to Yorba and Peralta on July 1, 1810. This 75,000-acre grant was made by Governor Arrellaga, and encompassed the majority of the Santa Ana Canyon of eastern Orange County, as well as much of northern Orange County and Newport Bay (Lech 2004). The children and grandchildren of Yorba and Peralta moved to various parts of the sizable rancho, and through time, the descendants absorbed additional acreage. The family holdings eventually encompassed lands extending from Riverside to the ocean.

In the early 1860s, Leonardo Cota, an extended family member, borrowed money from the largest landowner in southern California. Abel Stearns lent Cota money, and held his share of the Rancho as collateral. When Cota defaulted on his loan in 1866, Stearns filed a lawsuit in the Los Angeles Superior Court to demand a partition of the land, in order to claim Cota’s section. It took two years to determine how much land was due to each family member, and the rancho was then divided into 1,000 units for the heirs and the claimants in the lawsuit (City of Orange 2008).

The Los Angeles attorneys involved in the lawsuit, Alfred Chapman and Andrew Glassell, received a portion of the Rancho Santiago de Santa Ana as payment for their services. They quickly subdivided their land into a 1-square-mile town, with surrounding 10-acre farm lots. This community was named Richland until 1873, when the town’s application for a post office was denied due to the existence of another Richland in Sacramento County. According to local legend, Richland was renamed Orange after a poker game where Glassell, Chapman, and two other men allowed the winner to decide the new town name. Though the winner is not recorded, Richland was named Orange in January of 1875.

By 1873 Richland/Orange was beginning to grow by opening the first local store, named Fisher Brothers, a civic organization, called the Orange Grange, and the first church, which was of the Methodist Episcopal denomination. This was also the year that local farmers began planting orange groves in the area. The area then continued to grow when the Southern Pacific Railroad built a depot in Orange, in 1880, and again with the arrival of the Santa Fe railroad in 1887.

During the land boom of the 1880s, Orange attracted many travelers, founded local newspapers, build a public library, a bank and incorporation occurred on April 6, 1888. When the boom ended,
local farmers continued to plant orange trees. By 1929, Orange County produced more than $12 million from the sale of oranges. However, with the depression and inclement weather in the 1930s, the industry fell into economic decline (City of Orange 2008).

By the 1950s, a second real estate boom occurred, and large tracts of houses were constructed into the 1970s. Thereafter the City of Orange continued to grow at a steady pace, and development is still occurring, especially at the eastern edge of the city.

**Historic Era Aerial Photograph**

FCS (formerly MBA) additionally conducted a historic era aerial photograph review, from an image taken from the National Imagery Program for Orange County. This photograph was taken on December 12, 1952. During the historic era, the project area was part of an extensive sand and gravel mining operation, which began in approximately 1952 (LSA 1992). This process removed sand and gravel from alluvial deposits, and then processed the sediments in an open area located to the south of Santiago Creek. Evidence of the surface mining activity is observable in this photograph in the central portion of the project area, to the south of Santiago Creek. In this area, there is an absence of vegetation, multiple piles of soil, and numerous dirt tracks and/or unimproved access roads. Santiago Creek borders the surface mining area to the north, and numerous citrus groves are found to the southeast, south, and southwest along Santiago Canyon Road. In the southwestern corner of the project area, to the north of Santiago Canyon Road, and at the southern terminus of a windrow of eucalyptus trees is a clearing with apparent structures. These structures are situated between citrus groves, and appear to coincide with the location of a concrete foundation and an asphalt and concrete lot recorded during the pedestrian survey as Site 001. Additional citrus groves are found within the project area boundaries, to the north of Santiago Creek. These citrus groves appear to cover the recorded location of prehistoric-age site CA-ORA-369, which was detected during the cultural resources literature search at the South Central Coastal Information Center (SCCIC).

### 3.5.3 - Regulatory Framework

**Federal**

**National Historic Preservation Act**

The National Historic Preservation Act of 1966 (NHPA), as amended, established the National Register of Historic Places (NR), 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 NR 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 NR, 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

Senate Bill 18

California Senate Bill (SB) 18 states that prior to a local (city or county) government’s adoption of any general plan or specific plan, or amendment to general and specific plans, or a designation of open space land proposed on or after March 1, 2005, the city or county shall conduct consultations with California Native American tribes for the purpose of preserving or mitigating impacts to Cultural Places. A Cultural Place is defined as:

- Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine (PRC Section 5097.9), or;
- Native American historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of Historic Resources pursuant to Section 5024.1, including any historic or prehistoric ruins, any burial ground, or any archaeological or historic site (PRC Section 5097.995).

According to the Government Code (GC) Section 65352.4, “consultation” is defined as:

- The meaningful and timely process of seeking, discussing, and considering carefully the views of others, in a manner that is cognizant of all parties’ cultural values and, where feasible, seeking agreement. Consultation between government agencies and Native American Tribes shall be conducted in a way that is mutually respectful of each party’s sovereignty. Consultation shall also recognize the tribes’ potential needs for confidentiality with respect to places that have traditional tribal cultural significance.

While consultation is required to take place on a government-to-government level, the SB 18 process begins with a letter from the local government to the Native American Heritage Commission requesting a list of tribal organizations appropriate to the plan or plan amendment area or proposed open space designation. Once contacted by the local government, the tribes have up to 90 days to respond and request consultation regarding the preservation and treatment of known cultural place(s), if any have been identified by the tribe.

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.”

This law applies to any project that has a notice of preparation, a notice of negative declaration, or mitigated negative declaration filed on or after July 1, 2015. 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

**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 NR as a model, since the NHPA provides the highest standard for evaluating the significance of historic resources. A resource that meets the NR criteria is clearly significant. In addition, a resource that does not meet the NR standards may still be considered historically significant at a local or state level.

**California Environmental Quality Act**

The 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

City of Orange

General Plan

Cultural Resources and Historic Preservation Element

- **Goal 1.0**: Identify and preserve potential and listed historic resources, including buildings, structures, objects, sites, districts, and archaeological resources citywide.
- **Policy 1.3**: Provide long term assurance that potential and listed historic resources will be used, maintained, and rehabilitated in conformance with Secretary of the Interior’s Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Preserving Historic Buildings (Secretary’s Standards).
- **Policy 1.4**: Encourage alternatives to demolition such as architecturally-compatible rehabilitation, adaptive re-use, new construction, and relocation.
- **Goal 2.0**: Identify and preserve neighborhoods that are culturally and historically significant but do not retain sufficient integrity for eligibility as a local, state, or national district.
- **Goal 4.0**: Identify and preserve archaeological and cultural resources.
- **Policy 4.1**: Identify, designate, and protect historically and culturally significant archaeological resources or sites.
- **Policy 4.2**: Recognize the importance of Santiago Creek as an archaeological resource.
- **Policy 4.5**: Encourage private development to celebrate the cultural history of the community through project design.

Cultural Resources and Historic Preservation Plan

The City of Orange has traditionally focused its historic preservation efforts primarily on Old Towne. Since 1982, when the City of Orange undertook its first historic resources survey, enacted its first historic preservation element, and established the Old Towne Historic District through a zoning overlay, historic preservation has been a significant factor in the revitalization and economic vitality of Orange’s historic downtown. The current process of establishing an historic district is through a zoning overlay as outlined in the Zoning Ordinance; the City does not have a Historic Preservation Ordinance. By combining historic district designation with design standards, design review, and preservation incentives, the historic character of Old Towne has been maintained and preserved. As part of this effort, the City has developed public programs that provide city residents with a variety of informational tools advertising different options for historic preservation. The City actively promotes the Old Towne Design Standards, educates the public regarding architectural styles found in Old Towne, and provides public information on the Mills Act program, which provides incentives that may reduce property taxes on historic buildings in exchange for rehabilitation and maintenance of the owner’s historic resource. City Hall makes all of this information available, in addition to preservation maps and brochures, and city staff include experts who work on historic preservation projects throughout the City. A Design Review Committee reviews building projects throughout Old Towne.

3.5.4 - Methodology

Three technical studies have been previously prepared for the project site: (1) Phase I Cultural Resources Assessment and Paleontological Records Review prepared by Michael Brandman Associates; (2) Addendum to the Phase I Cultural Resources Assessment prepared by BCR Consulting;
and (3) the Updated Native American Consultation for the Rio Santiago Specific Plan Project prepared by BCR Consulting. Each report is discussed separately. These reports are provided in Appendix D.

**Phase I Cultural Resources Assessment and Paleontological Records Review**

Michael Brandman Associates prepared a Phase I Cultural Resources Assessment and Paleontological Records Review, dated December 3, 2008. Subsequently, on November 28, 2017, the records search was updated by an FCS archaeologist. An updated paleontological records search was ordered on November 21, 2017.

**Record Search**

*Information Center Search*

On October 7, 2008, FCS Project Archaeologist Jennifer M. Sanka conducted a records search at the SCCIC, which is located at California State University, Fullerton. To identify any historical or archaeological resources or historic properties, Ms. Sanka examined the current inventories of the NR, CR, California Historical Landmarks (CHL) list, and California Points of Historical Interest (CPHI). In addition, Ms. Sanka reviewed the HRI and archival maps for the County and the City to determine the existence of previously documented local historical resources.

Review of the 1896 United States Geological Survey (USGS) Anaheim, CA 30-minute and the 1902 (reprinted 1946) 30-minute Corona, Calif. Quadrangle maps revealed neither structures nor any other development within the project area boundaries. Both maps depict Santiago Canyon Road in its present location as an unnamed road, and both maps show a moderate amount of development associated with areas labeled Villa Park, El Modena and Orange to the west. The mountainous lands to the east are comparatively undeveloped. The 1942 USGS Anaheim, Calif. 15-minute Quadrangle map shows four structures along Santiago Canyon Road, alongside the southern project area boundary. Four additional structures are depicted in the southeastern corner of the project area, adjacent to a hammer and pick symbol. At this time, the lands to the west show an increased amount of development in comparison to earlier maps, and the lands to the east remain minimally developed.

According to SCCIC files, the majority of the project area has been previously surveyed, and portions exhibit numerous archaeological studies. A linear study was conducted along Santiago Canyon Road, and this extended across the majority of the southern project area boundary (ARMC 1999). This study returned negative results for cultural resources near the project area. Two studies have been conducted that assessed Santiago Creek (Drover 1976 and ECOS 1985). The ECOS (1985) testing program did not address any resources within the project area, while Drover (1976) detected one resource in the project area (CA-ORA-369). McKenna et al. assessed a similar project area to the present project area in 1999 (McKenna et al. 2000). The McKenna et al. project area appears to have excluded a negligible amount of project acreage in the westernmost and eastern-most extensions of the project area, based upon mapped location at the SCCIC and within their report. This study discussed the existence of previously recorded resource CA-ORA-369 in the northern portion of the project area, and that this resource could not be relocated in 1999. The study returned negative results for cultural resources within their project area.
Previously recorded resource CA-ORA-369 has been the subject of several studies and was mentioned in numerous reports. Drover (1976) located numerous shell fragments at the recorded site location, and found the site to be a minimal deposit with no interpretive use. APC (1979) collected surface artifacts and tested the resource for subsurface deposits. This study found that CA-ORA-369 did not exhibit sufficient depth, midden deposits or interpretive data to warrant additional studies. LSA (1994) and McKenna et al. (2000) could not relocate CA-ORA-369. Including all of the aforementioned studies, a total of 36 studies have been conducted within a 1-mile radius. Despite the high number of studies conducted, less than 50 percent of the acreage within the search radius has been assessed for cultural resources. A majority of the unexamined areas are urbanized, and were presumably developed prior to the more stringent cultural resource assessment requirements that currently exist.

In addition, the SCCIC records search indicated that there is one previously recorded prehistoric-age resource mapped within the project area boundaries, and one resource mapped adjacent to the easternmost portion of the project area. CA-ORA-1172 is a prehistoric-age artifact scatter mapped by the SCCIC as potentially extending into the eastern portion of the project area. However, the DPR 523 Form and the corresponding report map the resource on a knoll to the southeast of the project area boundaries (Hatheway and McKenna 1988). Thus, it does not appear that this site should extend into the present project area, and no artifacts were observed near the eastern-most portion during the pedestrian survey. CA-ORA-369 is mapped in the northeastern portion of the project area, and this site has been tested for subsurface deposits (APC 1979). Including these resources, there are eleven cultural resources known within the 1-mile search radius, including eight prehistoric-age and three historic-age resources. Two of the historic-age resources are NR listed properties, and these are located more than 0.25 mile from the project area. The following table outlines these previously recorded resources, as found in the 1-mile search radius on the Orange, California topographic quadrangle.

An updated records search was conducted at the South Central Coastal Information Center on November 28, 2017. The results of the records search indicate that there have been at least 5 additional cultural resources investigations conducted within a 1-mile radius of the project area since the 2008 study. Of those, none included any portion of the property. As noted in the 2008 study, eight prehistoric archaeological sites have been recorded within a 1-mile radius of the property. One of those, CA-ORA-369, was recorded on the property south of Maybury Street. The other, CA-ORA-1172, is recorded immediately adjacent to the southeast corner of the property, presumably outside the property boundary. None of the remaining six are located on or within 0.5 mile of the subject property. Three historic homes are recorded within 1 mile of the project area, but none are on the project area.

In summary, the results of the updated records search show that no new archaeological investigations have been conducted on the property since 2008, and no new archaeological sites have been recorded on or within a 1-mile radius of the property.

CA-ORA-369 was thoroughly studied in 1979 and found to yield insufficient depth, midden deposits, or other interpretive data to warrant further investigation. Subsequently, two archaeological surveys in 1994 and 2000 failed to locate any remains of the site. The 2008 investigation also failed to locate...
the site; however, given the dense vegetation, it was concluded that the site could be obscured, buried, or otherwise concealed from view and monitoring was recommended.

The 2008 investigation recorded an old concrete foundation and adjacent asphalt and gravel lot. The site was not indicated on the topographic records search map at the SCCIC, and no record of the site is on file with SCCIC. This is likely the fenced lot access via Jamestown off of Santiago. However, at the time of its recordation, it was deemed insignificant and no further work was recommended.

Table 3.5-1: Previously Recorded Cultural Resources

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Type</th>
<th>Distance From Project Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-179872</td>
<td>Historic age—A single-family craftsman-style residence built in ca. 1940. This structure was found not significant under CEQA through evaluation by the recorder.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>CA-ORA-1017</td>
<td>Prehistoric age—Artifact scatter consisting of flakes, hammerstones, a chopper, a metate and a core.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>CA-ORA-1018</td>
<td>Prehistoric age—Artifact scatter consisting of manos, metates, a hammerstone and a possible stone ball.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>CA-ORA-1019</td>
<td>Prehistoric age—Artifact scatter consisting of manos, metates, hammerstones, flakes and a core.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>CA-ORA-1020</td>
<td>Prehistoric age—Lithic scatter containing approximately 10 to 15 flakes.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>CA-ORA-1273</td>
<td>Prehistoric age—Artifact scatter and a rock ring. Noted artifacts include mano fragments, metate fragments, cores and flakes. Site was excavated in 1991.</td>
<td>&lt; 0.5 mile</td>
</tr>
<tr>
<td>CA-ORA-1172</td>
<td>Prehistoric age—Artifact scatter consisting of flakes, hammerstones, manos, metate and a “donut stone.”</td>
<td>&lt; 0.25 mile</td>
</tr>
<tr>
<td>CA-ORA-369</td>
<td>Prehistoric age—Artifact scatter consisting of cores, shells and flakes.</td>
<td>Adjacent to northern boundary of project site</td>
</tr>
<tr>
<td>CA-ORA-702</td>
<td>Prehistoric age—A scraper, a mano and a chopper found at the surface with indication of subsurface component.</td>
<td>&lt; 0.5 mile</td>
</tr>
<tr>
<td>30-176770/NR-02001725</td>
<td>Historic age—NRHP listed property (Historic Property)—Villa Park School.</td>
<td>&lt; 1 mile</td>
</tr>
<tr>
<td>30-160083/NR-83001212</td>
<td>Historic age—NRHP listed property (Historic Property)—Smith and Clark Brothers Ranch.</td>
<td>&lt; 0.5 mile</td>
</tr>
</tbody>
</table>

Source: South Central Coastal Information Center, 2008.

Native American Heritage Commission Record Search

On October 6, 2008, FCS sent a letter to the NAHC in an effort to determine whether any sacred sites are listed in their Sacred Lands File for this portion of the City of Orange. Our efforts were associated with CEQA-level information scoping only. The response from the NAHC was received on October
10, 2008. To ensure that all potential Native American resources are adequately addressed, letters to each of the 12 listed tribal contacts were sent on November 3, 2008. FCS received an emailed response from John Tommy Rosas, the Tribal Administrator for the Tongva Ancestral Territorial Tribal Nation on November 3, 2008. Mr. Rosas indicated that the Tribe objected to the project, and that development in that area violated their indigenous rights. He cited the project location along Santiago Creek as an especially sensitive issue. Further, he noted the need for additional consultation efforts as required by law, including Section 106 of the NHPA and SB 18. He also requested additional information on the proposed project. FCS Project Archaeologist Jennifer M. Sanka replied to this email, providing additional information on the Conceptual Development Plan and asking for any information that could be included in the Cultural Resources Assessment regarding the sanctity of Santiago Creek. This information was requested, as FCS was aware that Santiago Creek and adjacent environs would be considered a culturally sensitive area to local Tribes. This assumption is based upon the presence of numerous prehistoric-age sites along the Creek and a known reliance on its resources by the indigenous people as outlined in ethnographic studies.

Paleontological Records Search
The paleontological records check was requested on October 6, 2008. A response was received on October 31, 2008 from Dr. Samuel McLeod of the Vertebrate Paleontology Section of the Natural History Museum of Los Angeles County. The paleontological review indicated that the lowest lying portions of the Santiago Creek drainage consist of younger Quaternary alluvium, while the majority of the surrounding acreage has surficial deposits of older Quaternary terrace sediments. The exception is an area found on the north side of Santiago Creek that has exposures of undifferentiated deposits of the Oligo-Miocene Sespe/Vaqueros Formations. These exposures have marine and non-marine components (McLeod 2008).

Younger Quaternary alluvial deposits do not typically contain fossil resources, and no localities are known from such deposits or similar deposits nearby. In contrast, localities are known within the City of Orange from older Quaternary deposits at depth, and numerous localities are known within the general vicinity, as well as within the project area from the Sespe/Vaqueros Formations. The nearest locality from older Quaternary deposits is LACM 4943. This locality is recorded between State Route 55 and the Santa Ana River, near the intersection of Glassell Street and Fletcher Avenue. This locality yielded the fossilized remains of a horse (Equus) at depths of about 8 to 10 feet from the modern ground surface. LACM 5449 is recorded in the northeastern portion of the project area from exposures of the Sespe/Vaqueros Formations. This locality yielded the fossilized remains of an undetermined carnivore (Carnivora) and camel (Camelidae). LACM 5450, 5451, and 6927 to 6930 are all known from the Sespe/Vaqueros Formations, and are found near the project area boundaries. These localities have produced the fossil remains of an undetermined camel, skunk, rabbit, horse, peccary, and oreodont. The presence of one locality within the project area and numerous localities in the vicinity from sediments similar to those found within the project area aptly demonstrate the fossil bearing potential of these sediments.

An updated paleontological records search was requested on November 21, 2017.
Pedestrian Survey

FCS Project Archaeologist Jennifer M. Sanka, MA and FCS Senior Archaeologist Michael H. Dice, MA surveyed the project area on October 9, 2008. The site was examined using a block transect technique, with 10- to 15-meter spacing, where appropriate. Transect size was increased to the north of Santiago Creek, in the westernmost portion and in the southwestern project corner because of the presence of thicker ruderal vegetation, which resulted in lower accessibility and negligible surface visibility. Santiago Creek could not be surveyed because of the presence of water and thick vegetation; however, the sides of the bluffs were visually scrutinized in areas exhibiting visibility. The southeastern corner of the project area was not surveyed because of active concrete recycling activities. Transect size was decreased to about 5 meter spacing near the recorded location of CA-ORA-369.

The majority of the project area consists of previously disturbed soils that have been subject to historic era sand and gravel mining operations, as well as processing activities. Santiago Creek trends east-west through the northern portion of the project area, and the remains of a concrete bridge are found in the central portion, crossing the Creek. An active concrete recycling plant is located in the southeastern corner, and several abandoned concrete pads and metal tanks are located directly north of this area. Additional concrete pads and asphalt surfaces are surrounded by a chain-link fence within the southwestern project corner. This asphalt and concrete lot is found directly east of a concrete foundation of a no longer extant structure. The concrete and asphalt lot and the foundation are found directly to the north of Santiago Canyon Road. The project area was easily accessible from the entrance to the concrete recycling facility along Santiago Canyon Road. Access could also be obtained through a chain-link fence gate and a dirt access road found along the northern project boundary.

The project area exhibited varied surface visibility, ranging from poor to good. The surface visibility was very poor in the northern portion, in Santiago Creek, in the eastern-most and westernmost extensions, and in the southern-most, western corner. In these areas, visibility ranged from about 0 percent to 10 percent, due to the presence of dense vegetation. Visibility increased to about 50 percent in the central portion of the project area, and to about 100 percent along the dirt access roads found throughout.

The soils observed in the project area along the dirt access roads consisted of small gravels not more than 3 centimeters in diameter, found within a light brown alluvium. Numerous rock inclusions were noted throughout, ranging in size from pebbles to cobbles. These inclusions were rounded due to water-related erosion and some were angular. Concentrations of imported angular materials were noted in the northeast corner, to the north of Santiago Creek, in the central portion of the project area, and along the access roads in the southwesternmost project corner, westernmost extension and to the north of the active concrete recycling facility. Additional angular rocks were noted along the other access roads, and appeared to have been altered due to vehicular activity. A concentration of concrete fragments was observed in the central portion of the project area. The surface soils have been adversely impacted by vehicular activity, heavy machinery, historic-era sand and gravel mining operations, active concrete recycling activities, and historic-era citrus cultivation.
Furrows were observed in the northern and eastern-most extensions of the project area, and these presumably relate to the past use of the project area for the production of citrus crops.

Relatively minimal modern refuse was noted throughout the project area, and was more prevalent in the northern portion, along the northern boundary and in a vegetation-laden field in the southern central portion. Observed refuse included plastic oil containers, clothing, a Christmas ornament, and several full plastic trash bags presumably containing modern, domestic refuse.

During the pedestrian survey, no prehistoric-age resources and one potentially historic-age foundation and an adjacent asphalt and concrete lot were detected. Portions of the concrete and asphalt lot may be of historic age, and were recorded in conjunction with the foundation as Site 001. In addition, previously recorded prehistoric-age resource CA-ORA-369 could not be relocated.

**CA-ORA-369**
CA-ORA-369 was originally recorded on October 13, 1972 by A. Marquette and J. Houser as a prehistoric-age artifact scatter within an area cleared of vegetation (Marquette and Houser 1972). At that time, the site consisted of a polyhedral core, shell scatter, flake waste and additional cores, and measured approximately 300 meters by 300 meters. The mapped location of this site is found in the northeastern quarter of the project area, to the north of Santiago Creek. The site was relocated in 1976 by Drover as an extremely minimal prehistoric deposit (Drover 1976). Drover notes that the site lacks interpretive data, and that it should be subsurface tested prior to any disturbance. This site was then surface collected and tested for the presence of subsurface artifact deposits in 1979 (APC 1979). The Archaeological Planning Collaborative (APC) mapped the presence of surface artifacts, conducted soil pH analysis, and then excavated two test units in areas proposed to be impacted by the Deimer Pipeline Project. A total of 11 lithics, 12 shell fragments, three fire-affected rocks, and one hammerstone were collected at the surface. Two lithics were recovered from the subsurface, and no diagnostic artifacts or midden deposits were detected. Based upon this data, the site was determined to be a surface scatter with little to no depth, and of no interpretive value for the prehistory of the area. Rather, the site appeared to be a peripheral site related to the more permanent sites found elsewhere along Santiago Creek. For this reason, the construction of the pipeline was found to result in no significant loss of archaeological data, and APC suggested that the site be avoided as much as possible during the installation of the pipeline (APC 1979). Based upon the results of this subsurface testing program the interpretation of the data, the site does not appear to be significant under the provisions of CEQA.

**Historic Age Foundation/Concrete and Asphalt Lot (Site 001)**
Located in the southwestern corner of the project area is a concrete foundation from a no longer extant building and an adjacent concrete and asphalt lot surrounded by a chain-link fence. These features are found directly to the north of Santiago Canyon Road, and presumably relate to the previous use of portions of the project area for the production of citrus, and then as a sand and gravel surface mining and processing center. The foundation and some of the concrete pads may relate to the citrus groves that once occupied portions of the project area, and structures appear to be present at this location in the Historic Era Aerial Photograph presented as Exhibit 3.5-1. The exact date of the currently observable features are unknown, but portions of the site are of historic age.
based upon the results of the aerial photograph review. For this reason, all of the existing features were recorded as constituents of an archaeological site.

The concrete foundation is currently surrounded by vegetation and filled with cut eucalyptus trees and other assorted vegetation waste. Three of the four sides of the foundation are still extant, as the northern side appears to be missing. Modern refuse was noted to the north of the foundation, and a dirt road is found to the east. Eucalyptus windrows are found trending north-south, within the general vicinity of the site. A concrete pad is located approximately 15 to 20 meters to the southeast of the foundation, and no evidence of a date stamp was observed. A utility pole is also located near this concrete pad, and the pole exhibits the identification number 718839E. This pole also exhibits two nails, reading 25 and 48, from left to right. These presumably indicate that the pole is 25 feet tall, and was either erected or inspected in 1948. It is probable that these features are represented at the southern terminus of a north-south trending eucalyptus windrow. Their presence indicates that at least some of the features in this area were present by 1952, and may indicate their association with citrus production within the project area. Additional concrete pads were also noted to the east of the foundation and utility pole, and some or all of these concrete pads may have been contemporaneous to the foundation. These pads may have been reused, as they could have been incorporated into the existing concrete and asphalt lot.

Located to the east of the concrete foundation and utility pole is a concrete and asphalt lot surrounded by a chain-link fence. No date stamps could be located within this lot, despite the visual scrutiny of the entire surface. This area has painted parking spaces in the western portion, a concrete ramp/roll-off in the southwestern corner, and abandoned soil sorting equipment in the central portion. One of the machines exhibits a conveyor belt, presumably used to sort the aggregate, and the other machine retained a brand name that reads “Product of Deister Machine Company, Fort Wayne, Indiana.”

According to the Deister Machine, Inc. website, Deister Machine is a family owned business that began in Fort Wayne, Indiana in 1912. The company began with the construction of a separating table, which used differential motion to separate ore from lighter particles. The ridges found on the separating table caught the heavier ore, and then water was used to wash away the lighter soil particles (Deister Machine, Inc. 2008). The machine present within the concrete and asphalt lot is presumably a separating machine, and appears to be consistent with a product known as a basemounted, step-deck vibrating grizzly. The product label present within the project area appears to be consistent with relatively modern Deister product labels. However, the website does not provide any information on the evolution of the Deister Machine, Inc. brand-name label.

This resource was recorded onto a Department of Parks and Recreation (DPR) 523 Form and was submitted to the SCCIC for the assignment of a primary number. The site does not appear to be significant and is considered neither a historical nor an archaeological resource for the purposes of CEQA.
Legend

- Project Site
- Archaeological and Paleontological Monitoring Areas

Exhibit 3.5-1
Archaeological and Paleontological Monitoring Areas

Source: ESRI Imagery, 2015
A new pedestrian survey was conducted for the property on December 1, 2017. Most of the property south of the creek has been heavily impacted from sand and gravel activities. Only one small area in the southwest corner immediately east of a fenced construction yard could be surveyed. However, in the northernmost section of the property, immediately south of Mabury Street, is a relatively narrow strip of land in that general area where CA-ORA-369 was originally recorded, ultimately tested, and found ineligible for the CR. Most of that part of the property had been recently graded, exposing surface soils over most of the area, which were surveyed. The new survey located a Fletcher’s Castoria bottle (ca. 1900–1930). No other historic period artifacts were noted in the area. In the general area where CA-ORA-369 was located, a single Argopectin spp. shell fragment was observed. No other prehistoric artifacts were observed. Neither artifact was collected and no further work is recommended in the area of the two items. The 2008 investigation recorded an old concrete foundation and adjacent asphalt and gravel lot. The site was not indicated on the topographic records search map at the SCCIC, and no record of the site is on file with SCCIC. This is likely the fenced lot across from Jamestown Way off of E. Santiago Canyon Road. At the time of its recordation, it was deemed insignificant and no further work was recommended. The lot is currently used for parking and various activities related to the mining. Nothing of historic significance was observed within the fenced lot during the new survey.

**Addendum to the Phase I Cultural Resources Assessment**

BCR Consulting prepared an Addendum to the Phase I Cultural Resources Assessment, dated March 25, 2011. The Addendum addressed peer review comments, a revised project description, updated information regarding local prehistoric cultural sequence and villages, expanded city history, and more explicitly defined recommendations with a figure depicting monitoring areas.

**Updated Native American Consultation**

An updated Native American Consultation for the Rio Santiago Specific Plan Project was prepared by BCR Consulting, dated May 12, 2011. Subsequently, on March 3, 2017, the City contacted three tribes pursuant to AB 52. Each tribe was notified in writing of the proposed project and invited to consult with the City. The letters were sent via certified mail, but to date the City has not received any responses.

**3.5.5 - 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?

Additionally, Appendix G sets forth the following thresholds of significance for tribal cultural resources:

a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

b) 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

c) 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 Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

3.5.6 - 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**

The results of the cultural resource record search indicate that there is one previously recorded resource within the project area boundaries, and a total of eleven resources within the search radius. Eight prehistoric-age and three historic-age resources are recorded within 1 mile of the project area. Two of the historic-age resources are NR listed properties, and these are located more than 0.25 mile from the project area. However, these resources will not be affected by the proposed project.

Review of the 1896 United States Geological Survey (USGS) Anaheim, CA 30-minute and the 1902 (reprinted 1946) 30-minute Corona, Calif. Quadrangle maps revealed neither structures nor any other development within the project area boundaries. The 1942 USGS Anaheim, Calif. 15-minute Quadrangle map shows four structures along Santiago Canyon Road, along the southern project area boundary. Four additional structures are depicted in the southeastern corner of the project area, adjacent to a hammer and pick symbol. With the exception of one potentially historic-age foundation and an adjacent concrete and asphalt lot, no evidence of these structures were detected during the pedestrian survey.

During the pedestrian survey, no prehistoric-age resources and one potentially historic-age foundation and an adjacent asphalt and concrete lot were detected. Portions of the concrete and
asphalt lot may be of historic age, and were recorded in conjunction with the foundation as Site 001. These features presumably relate to the previous use of the project area for citrus production and as a surface mining and processing center. This resource was recorded onto a Department of Parks and Recreation (DPR) 523 Form and was submitted to the SCCIC for the assignment of a primary number. The site does not appear to be significant and is considered neither a historical nor an archaeological resource for the purposes of CEQA. Therefore, the creation and submittal of the DPR 523 Form for this resource fully suffices for mitigating potential impacts associated with the proposed project. An additional DPR 523 Update Form was created for previously recorded resource CA-ORA-369, in an effort to keep their files current. This resource could not be relocated during the present survey or during previous surveys (LSA 1994; McKenna et al. 2000). This is presumably due to the negligible surface visibility at the mapped location, and to the collection of some or all of the surface artifacts during a subsurface testing program (APC 1979). This testing program yielded a small amount of debitage, no diagnostic artifacts and no observable midden deposits. The site was determined to be a surface scatter with little to no depth, and of no interpretive value for the prehistory of the area. Based upon the results of this subsurface testing program and the interpretation of the data, the site does not appear to be significant under the provisions of CEQA. Presently, the mapped location of the site is within the portion of the project area proposed as open space. Therefore, minimal impacts would occur to the remnants of the site, as its location would be entirely avoided by development.

Based upon the results of the records search, where a previously recorded resource is known within the project area, the location along Santiago Creek, which exhibits numerous prehistoric-age sites in the region, and the negligible surface visibility during the pedestrian survey, FCS finds a high probability that significant, intact subsurface deposits could be uncovered during development. This potential is high within undisturbed or minimally disturbed portions of the project area and significantly lower in areas that have been subject to historic-era surface mining and processing activities. Therefore, the project area has been generally assigned high cultural resource sensitivity, and FCS recommends archaeological monitoring in specific portions during development. Monitoring during development would reduce project impacts to less than significant levels.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM CUL-1**  
In the event that buried cultural resources are discovered during construction, operations shall stop within a 50-foot radius of the find and a qualified archaeologist shall be consulted to determine whether the resource requires further study. The qualified archaeologist 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.
area should be recorded on appropriate Department of Parks and Recreation (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 in accordance with Public Resource Code Section 21083.1 and CEQA Guidelines Section 15126.4 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.

**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**

As addressed in Impact CUL-1, the archaeological records search identified one previously recorded resource within the project boundary. Additionally, portions of the concrete and asphalt lot may be of historic age. Based upon the results of the records search, where a previously recorded resource is known within the project area, the location along Santiago Creek, which exhibits numerous prehistoric-age sites in the region, and the negligible surface visibility during the pedestrian survey, FCS finds a high probability that significant, intact subsurface deposits could be uncovered during development. A qualified archaeologist shall be contacted to assess the nature and significance of a find in the event an archaeological resource is recovered, as addressed in Mitigation Measure CUL-1. The implementation of this mitigation measure will ensure that construction shall stop in the vicinity of any potential resource until the significance of the resource is confirmed, and will ensure that significant resources will be avoided or excavated and preserved. With implementation of mitigation, impacts associated with archaeological resources would be less than significant.

Additionally, the 2011 Addendum prepared by BCR Consulting indicated that archaeological monitoring is required during ground disturbing activities within the areas depicted on Exhibit 3.5-1. As such, Mitigation Measure CUL-2 requires monitoring within these areas during disturbing activities. With implementation of mitigation, impacts associated with archaeological resources would be less than significant.
**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**
Implement Mitigation Measure CUL-1 and:

**MM CUL-2**
During the ground disturbing activities in the areas depicted in Exhibit 3.5-1, a qualified archaeological and paleontological monitor shall be present on-site to observe earthwork activities. In the event of a discovery of an archaeological or paleontological resource, the monitor shall have the discretion to halt all ground disturbing activities within 50 feet of the find until it has been evaluated for significance. If the find is determined to have archaeological or paleontological, the procedures in Mitigation Measure CUL-1 or Mitigation Measure CUL-3 shall be implemented. Monitoring may cease once all of the areas depicted in Exhibit 3.5-1 have been thoroughly disturbed.

**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**
The paleontological review indicated that the lowest lying portions of the Santiago Creek drainage consist of younger Quaternary alluvium, while the majority of the surrounding acreage has surficial deposits of older Quaternary terrace sediments. These exposures have marine and non-marine components. The records check indicated that localities are known from such deposits and are known within the City of Orange.

Based upon the results of this review, it is possible that significant paleontological resources may be adversely impacted by development-related ground disturbance. Therefore, FCS has determined that the project area has varied paleontologic sensitivity, ranging from low to high. This potential is considered low in the younger Quaternary deposits, and high for older Quaternary terrace deposits at depth and for any exposures of the Sespe/Vaqueros Formations. A paleontologic monitoring program is recommended by FCS to mitigate potential adverse impacts to paleontological resources in the older Quaternary terrace deposits at depth and in any exposures of the Sespe/Vaqueros Formations. A monitoring program for excavation should be developed prior to any grading within the project area, and should be consistent with the provisions of CEQA. Implementation of the paleontological monitoring program would reduce project impacts to less than significant levels.

Additionally, the 2011 Addendum prepared by BCR Consulting indicated that paleontological monitoring is required during ground disturbing activities within the areas depicted on Exhibit 3.5-1. An updated paleontological records search conducted in November of 2017 supports this conclusion. As such, Mitigation Measure CUL-2 requires monitoring within these areas during ground-disturbing
activities. With implementation 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**
If the subsurface excavations for this project are proposed to exceed depths of 15 feet below surface, a qualified paleontological monitor should be retained to observe such excavations, which may breach the older Quaternary Alluvium deposits. In this situation, a detailed Mitigation Monitoring Plan (MMP) or Paleontological Resource Impact Management Plan (PRIMP) should be prepared in order to set forth the observation, collection, and reporting duties of the paleontological monitor. Additional mitigation measures and procedures will be outlined in the MMP or PRIMP as needed.

In the event that fossils or fossil-bearing deposits are discovered during construction activities that are shallower than 10 feet in depth, excavations within a 50-foot radius of the find shall be temporarily halted or diverted. The project contractor shall notify a qualified paleontologist to examine the discovery. The paleontologist shall document the discovery as needed (in accordance with Society of Vertebrate Paleontology standards), evaluate the potential resource, 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 Lead Agency 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**

There are no existing or known formal cemeteries within or adjacent to the project site. As a result, project implementation is not anticipated to impact human remains associated with either a formal or informal cemetery. However, there is always the possibility that ground-disturbing activities during construction may uncover previously unknown buried human remains. Should this occur, the procedures set forth in Public Resource Code Section 5097.98 would apply and are reflected in
Mitigation Measure CUL-4. Implementation of this mitigation measure would reduce impacts to a level of less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM CUL-4**

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 Native American Heritage Commission (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.

**Level of Significance After Mitigation**

Less than significant impact.
3.6 - Geology and Soils

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 information contained in the Geotechnical Investigation prepared by Ginter & Associates, Inc., which is provided in Appendix E.

3.6.1 - Existing Conditions

Regional Geology

The project site is situated in the northeastern portion of the Peninsular Ranges Geomorphic Province at an average elevation of approximately 400 feet above mean sea level and subjacent to the Santa Ana Mountains, which rise to the east to more than 3,000 feet above mean sea level. Santiago Creek, which flows through the site, transports sediments and forms coalescing alluvial fans, resulting in a broad surface that slopes away from the hills toward the Pacific Ocean to the southwest.

Seismic Hazards

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 City of Orange is located in the seismically active southern California region. The largest faults in the region include the Whittier-Elsinore fault, the Newport-Inglewood fault, the San Andreas fault, and the San Jacinto fault. The northwestward flow of the Pacific Plate mantle is now driving the collision between the Peninsular Ranges block and the Sierra-Great Valley provinces of the North American plate.

There are no active faults known to pass through the project site. In addition, there are no Alquist-Priolo Fault Zones in the immediate project vicinity. The nearest, known active faults are the Peralta Hills thrust fault located approximately 0.1 mile northeast of the project site, and the El Modeno fault located approximately 0.43 mile southwest of the project site.

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, soil liquefaction, and lateral spreading. These hazards are discussed individually.

Fault 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. As previously indicated, no active faults are known to pass through the project site. In addition, there are no Alquist-Priolo Fault Zones in the immediate project vicinity.

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.

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.

According to the California Geological Survey Liquefaction Hazard Zoning Map, the project site is located within a liquefaction hazard zone. A Liquefaction Evaluation Report prepared for the Orange 7.5-minute quadrangle, Orange County, California indicated that areas where younger fan deposits and active wash deposits are included in liquefaction hazard zones. The liquefaction potential for the project site is low to moderate.

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. Lurching is the movement of the ground surface toward an open face when the soil liquefies. An open face could be a graded slope, stream bank, canal face, gully, or other similar feature.

**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 rockfalls.

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 four most common types of landslides are translational, rotational, earth flow, and rock fall. Debris flows and earth flows are another type of landslide that are characterized by soil and rock particles in suspension with water and which often move with considerable speed. Debris flows often refer to flows that contain coarser soil and rock materials while earth flows frequently refer to slides that are predominantly finer materials. Mudslide is a term that appears in non-technical literature to describe a variety of shallow, rapidly moving earth flows.

According to the City of Orange General Plan EIR, the project site is not located within a landslide hazard area as mapped on the Environmental and Natural Hazard Policy map. The project site is not located within the vicinity of large hills or steep mountainsides.
Soils

The United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey maps the project site as containing pits, Modjeska gravelly loam, Soboba gravelly loamy sand, and Botella clay loam. Table 3.6-1 summarizes the soils that underlie the project site.

Table 3.6-1: Soil Summary

<table>
<thead>
<tr>
<th>Soil</th>
<th>Landform</th>
<th>Parent Material</th>
<th>Drainage Class</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pits*</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Modjeska gravelly loam, 2 to 9 percent slopes</td>
<td>Terraces</td>
<td>Alluvium derived from mixed</td>
<td>Well drained</td>
</tr>
<tr>
<td>Soboba gravelly loamy sand, 0 to 5 percent slopes</td>
<td>Alluvial fans</td>
<td>Sandy and gravelly alluvium derived from mixed</td>
<td>Excessively drained</td>
</tr>
<tr>
<td>Botella clay loam, 2 to 9 percent slopes</td>
<td>Alluvial fans</td>
<td>Alluvium derived from sedimentary rock</td>
<td>Well drained</td>
</tr>
</tbody>
</table>

Note:
* Signifies that area has been surface mined

3.6.2 - Regulatory Setting

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**

**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 (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 applies to building design and construction in the state and is based on the federal Uniform Building Code used widely throughout the country (generally adopted on a state-by-state or district-by-district basis). The Building Code has been modified for California conditions with more detailed and/or more stringent regulations.
The State’s 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 Building Code. The Building Code identifies seismic factors that must be considered in structural design. Chapter 18 of the Building Code 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 Building Code is updated every 3 years, and the current 2016 CBC took effect January 1, 2017.

Local Regulations

City of Orange

General Plan

The City of Orange set forth the following goals, objective, and policies that are relevant to geology, soils, and seismicity:

Public Safety Element

- **Goal 1.0**: Protect residents and businesses from seismic hazards and other geologic constraints.
- **Policy 1.1**: Minimize the potential loss of life and damage to structures that may result from an earthquake.
- **Policy 1.2**: Educate and train individuals and neighborhoods how to respond to emergency situations.

Infrastructure Element

- **Goal 5.0**: Ensure lifeline infrastructure systems that meet the City’s public health and safety needs.
- **Policy 5.3**: Identify engineering vulnerabilities in lifeline utilities exposed to human caused and natural hazards, including seismic activity, wildland fire, and flooding.
- **Policy 5.5**: Review and limit the location and intensity of development and placement of lifeline infrastructure in identified earthquake fault zones.

City of Orange Grading Requirements

The City’s Municipal Code, Section 17.10.90 describes rules and regulations to control erosion associated with grading activities.

3.6.3 - Methodology

FCS relied upon the Geotechnical Investigation prepared by Ginter & Associates, Inc., which is provided in Appendix E. FCS also obtained from sources including the City of Orange General Plan, the California Department of Conservation, and the United States Department of Agriculture Natural Resources Conservation Service Web Soil Survey. Additionally, FCS performed a preliminary site visit in which photos and additional notes were taken about the site and its surroundings. A Geotechnical Report was not prepared as a part of the proposed project, but future design-level geotechnical
investigations will be required once development under the Specific Plan is ready to proceed, prior to the issuance of building permits.

3.6.4 - 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?

3.6.5 - 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 may expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death involving seismic hazards. |

Impact Analysis

This impact assesses the potential for the proposed project to expose people or structures to potential substantial adverse effects involving seismic hazards.

Fault Rupture

As mentioned previously, no known active faults have been mapped on the project site; however, both the El Modeno and Peralta Hills faults are located less than 0.5 mile from the project site. A
1991 fault investigation prepared by Pacific Soils Engineering, Inc. concluded that an inferred trace of the El Modeno Fault does not cross the project site. Furthermore, the El Modeno fault is considered inactive. Similarly, the Peralta Hills Fault was found to not be sufficiently active under the Alquist-Priolo Special Studies Zone Act by the California Division of Mines and Geology. For these reasons, the development of the proposed project would not expose persons or structures to fault rupture hazards. Impacts would be less than significant.

**Strong Ground Shaking**

The southern California region 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 site to known active seismic sources, it should be expected that the site will 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 Building Code requirements as a minimum. At the time of this writing, a design-level geotechnical report for the Project was not available. Such a report would provide recommendations on the appropriate level of soil engineering and building design necessary to minimize ground-shaking hazards. Accordingly, Mitigation Measure GEO-1 is proposed requiring the applicant to submit such a study to Orange County for review and approval prior to proceeding with development consistent with the Specific Plan analyzed in this EIR. The implementation of this mitigation measure would ensure that impacts related to strong ground shaking hazards would be less than significant.

**Ground Failure and Liquefaction**

As indicated above, the potential for liquefaction for the entire project site is considered low to moderate. The 1997 Seismic Hazard Zone prepared for the project site and its surrounding area concluded that the liquefaction potential for the project site is nominal. However, because of the proposed project’s location to Santiago Creek, the potential for liquefaction should be further explored and addressed during a design-level geotechnical exploration.

**Landslides**

The project site is not located within the vicinity of large hills or steep mountainsides. Because of the lack of significant topography, land sliding is not expected on the project site. Therefore, no impact is anticipated related to land sliding.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM GEO-1**

Prior to the issuance of building permits, the project applicant shall submit a design-level Geotechnical Investigation to City of Orange for review and approval. The investigation shall be prepared by a qualified engineer and identify grading and building practices necessary to achieve compliance with the latest adopted edition of the California Building Standards Code’s geologic, soils, and seismic requirements. The measures identified in the approved report shall be incorporated into the Project plans.
Level of Significance After Mitigation
Less than significant impact.

Erosion

Impact GEO-2: The project will result in substantial soil erosion or the loss of topsoil.

Impact Analysis
The project would involve the development of residential uses on 40.2 acres of the project site and open space and recreation uses on the remaining acreage. Development activities would involve vegetation removal, grading, soil engineering, and other activities that have the potential to result in erosion. If left unabated, the accumulation of sediment in downstream waterways could result in the blockage of flows, potentially causing increased localized ponding or flooding. However, as detailed in Section 3.9, Hydrology and Water Quality, the project will be subject to the City’s existing regulations requiring implementation of stormwater quality control measures during construction activities. Some pollution prevention practices include erosion control measures such as backflow prevention devices and vegetating disturbed areas, which would prevent soil and sediment from entering downstream waterways. These pollution prevention measures are incorporated into Mitigation Measure HYD-1a.

In summary, through the implementation of Mitigation Measures GEO-1 and HYD-1a, impacts from erosion would be less than significant.

Level of Significance Before Mitigation
Potentially significant impact.

Mitigation Measures
Implement Mitigation Measure GEO-1 and HYD-1a.

Level of Significance After Mitigation
Less than significant impact.

Unstable Geologic Units or Soils

Impact GEO-3: The project would not 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
The project site is underlain by terraces and alluvial fans near Santiago Creek. Terraces and alluvium are considered stable and suitable to support urban development. Standard grading and soil engineering practices would be required for compliance with state and local building code standards, and thus are not included separately as mitigation. Compliance with these mandatory standards would ensure that project foundations were adequately supported and are not at risk of failure due to unstable geologic units or soils. 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.

Expansive Soil

Impact GEO-4: The project would not 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.

Impact Analysis
The project site is underlain by Modjeska gravelly loam (2 to 9 percent slopes), which is well-drained in mixed alluvium on terraces; Soboba gravelly loam (0 to 5 percent slopes), an excessively drained soil formed in alluvium from granitic rocks; and Botella clay loam (2 to 9 percent slopes), a well-drained soil formed in alluvial material from sedimentary rocks. The majority of the soils on-site consist of gravelly and stony sands with low clay content. Moreover, the project site previously supported aggregate mining (sand and gravel). As such, these soil types do not retain water in a manner such that they would have a substantial shrink-swell potential. Additionally, standard grading and soil engineering practices would be performed in accordance with state and local building code standards to ensure that expansive soils do not pose a risk to structures developed under the Specific 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.
3.7 - Greenhouse Gas Emissions

This section describes the existing greenhouse gas 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 information provided by the California Emissions Estimator Model (CalEEMod Version 2016.3.1) was used to quantify project-related emissions. The Greenhouse Gas Analysis is included in this Draft EIR as Appendix B.

3.7.1 - Existing Conditions

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. This data is used 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 2007a). 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-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations.”

An individual project cannot generate huge amount of GHG emissions to effect a significant 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).

- **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 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.

- **Increase risk of large wildfires.** If rain increases as temperatures rise, wildfires in the grassland 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 the Orange County**

Figure 3.7-1 displays a chart of measured historical and projected annual average temperatures in the Orange County 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 3.6 degrees Fahrenheit (°F) under the low-emissions scenario, and 6.1°F under the high emissions scenario (Cal Adapt 2016).
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 in its report, Global Climate Change Impacts in the U.S. (2009) 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 includes:

- 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-included increases in the frequency of smog (ground-level ozone) events and particulate air pollution (EPA 2009a).

Source: CalAdapt 2016. Website: http://cal-adapt.org/tools/factsheet/
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 indoor concentrations (not at levels existing outside), carbon dioxide, methane, sulfur hexafluoride, and some chlorofluorocarbons can cause suffocation as the gases can displace oxygen (CDC 2010 and OSHA 2003).

Climate Change

Global climate change is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. Global climate change is currently one of the most controversial environmental issues in the United States, and much debate exists within the scientific community about whether or not global climate change is occurring naturally or as a result of human activity. Some data suggests that global climate change has occurred in the past over the course of thousands or millions of years. These historical changes to the Earth’s climate have occurred naturally without human influence, as in the case of an ice age. However, many scientists believe that the climate-shift taking place since the industrial revolution (1900) is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that global climate change is the result of increased concentrations of greenhouse gases in the earth’s atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. Many scientists believe that this increased rate of climate change is the result of greenhouse gases resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed project cannot generate enough greenhouse gas emissions to effect a discernible change in global climate. However, the project may participate in the potential for global climate change by its incremental contribution of greenhouse gases combined with the cumulative increase of all other sources of greenhouse gases, which when taken together constitute potential influences on global climate change.

Global Climate Change Defined

Global climate change refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation, and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO₂ (carbon dioxide), N₂O (nitrous oxide), CH₄ (methane), hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. These particular gases are important because of their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the Earth’s atmosphere, but prevent radioactive heat from escaping, thus warming the Earth’s atmosphere. Global climate change can occur naturally as it has in the past with the previous ice ages. According to the California Air Resources Board (ARB), the climate change since the industrial revolution differs from previous climate changes in both rate and magnitude.

Gases that trap heat in the atmosphere are often referred to as greenhouse gases. Greenhouse gases are released into the atmosphere by both natural and anthropogenic (human) activity. Without the natural greenhouse gas effect, the Earth’s average temperature would be approximately...
61°F cooler than it is currently. The cumulative accumulation of these gases in the earth’s atmosphere is considered to be the cause for the observed increase in the earth’s temperature.

Although California’s rate of growth of greenhouse gas emissions is slowing, the State is still a substantial contributor to the U.S. emissions inventory total. In 2004, California is estimated to have produced 492 million metric tons of carbon dioxide equivalents (MMT CO\textsubscript{2}e) greenhouse gas emissions. Despite a population increase of 16 percent between 1990 and 2004, California has significantly slowed the rate of growth of greenhouse gas emissions because of the implementation of energy efficiency programs as well as adoption of strict emission controls.

Greenhouse Gases

For the purposes of this analysis, emissions of carbon dioxide, methane, and nitrous oxide were evaluated because these gases are the primary contributors to global climate change from development projects. Although other substances such as fluorinated gases also contribute to global climate change, sources of fluorinated gases are not well defined and no accepted emissions factors or methodology exist to accurately calculate these gases.

As shown in Table 3.7-1, greenhouse gases have varying global warming potential (GWP) values; GWP values represent the potential of a gas to trap heat in the atmosphere. Carbon dioxide is utilized as the reference gas for GWP, and thus has a GWP of 1.

Table 3.7-1: Global Warming Potentials and Atmospheric Lifetime of Select GHGs

<table>
<thead>
<tr>
<th>Category</th>
<th>Atmospheric Lifetime (years)</th>
<th>Global Warming Potential (100 year time horizon)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon dioxide</td>
<td>50 to 200</td>
<td>1</td>
</tr>
<tr>
<td>Methane</td>
<td>12±3</td>
<td>25</td>
</tr>
<tr>
<td>Nitrous oxide</td>
<td>120</td>
<td>298</td>
</tr>
<tr>
<td>HFC-23</td>
<td>264</td>
<td>11,700</td>
</tr>
<tr>
<td>HFC-134a</td>
<td>14.6</td>
<td>1,300</td>
</tr>
<tr>
<td>HFC-152a</td>
<td>1.5</td>
<td>140</td>
</tr>
<tr>
<td>PFC: Tetrafluoromethane (CH\textsubscript{4})</td>
<td>50,000</td>
<td>6,500</td>
</tr>
<tr>
<td>PFC: Hexafluoroethane (C\textsubscript{2}F\textsubscript{6})</td>
<td>10,000</td>
<td>9,200</td>
</tr>
<tr>
<td>Sulfur hexafluoride (SF\textsubscript{6})</td>
<td>3,200</td>
<td>23,900</td>
</tr>
</tbody>
</table>


Greenhouse Gas Emissions Inventories

Global

Worldwide anthropogenic (man-made) greenhouse gas (GHG) emissions are tracked by the Intergovernmental Panel on Climate Change for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Man-made GHG emissions data for Annex I nations
are available through 2011. For the year 2011, the sum of these emissions totaled approximately 25,285,543 gigagrams (Gg) CO₂e. The GHG emissions in more recent years may differ from the inventories presented in Table 3.7-2; however, the data are representative of currently available inventory data.

Table 3.7-2: Top GHG Producer Countries and the European Union

<table>
<thead>
<tr>
<th>Emitting Countries</th>
<th>GHG Emissions (Gg CO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>8,715,307</td>
</tr>
<tr>
<td>United States</td>
<td>6,665,700</td>
</tr>
<tr>
<td>European Union (27 member countries)</td>
<td>4,550,212</td>
</tr>
<tr>
<td>Russian Federation</td>
<td>2,320,834</td>
</tr>
<tr>
<td>India</td>
<td>1,725,762</td>
</tr>
<tr>
<td>Japan</td>
<td>1,307,728</td>
</tr>
<tr>
<td>Total</td>
<td>25,285,543</td>
</tr>
</tbody>
</table>


**United States**

As noted in Table 3.7-2, the U.S., as a single country, was the number two producer of GHG emissions in 2011. The primary greenhouse gas emitted by human activities in the U.S. was CO₂, representing approximately 83 percent of total greenhouse gas emissions. Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 78 percent of the GHG emissions.

**State of California**

The California Air Resources Board (ARB) compiles GHG inventories for the State of California. Based upon the 2008 GHG inventory data (i.e., the latest year for which data are available) for the 2000–2008 greenhouse gas emissions inventory, California emitted 474 MMT CO₂e including emissions resulting from imported electrical power in 2008. Based on the ARB inventory data and GHG inventories compiled by the World Resources Institute, California’s total statewide GHG emissions rank second in the United States (Texas is number one) with emissions of 417 MMT CO₂e, excluding emissions related to imported power.

**Environmental Effects of Climate Change in California**

The California Environmental Protection Agency (CalEPA) published a report titled “Scenarios of Climate Change in California: An Overview” (Climate Scenarios report) in February 2006, that while not adequate for a CEQA project-specific or cumulative analysis, is generally instructive about the statewide impacts of global warming.

The Climate Scenarios report uses a range of emissions scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) to project a series of potential warming ranges
(i.e., temperature increases) that may occur in California during the 21st century: lower warming range (3.0–5.5°F); medium warming range (5.5–8.0°F); and higher warming range (8.0–10.5°F). The Climate Scenarios report then presents an analysis of future climate in California under each warming range, that while uncertain, present a picture of the impacts of global climate change trends in California.

In addition, most recently on August 5, 2009, the State’s Natural Resources Agency released a public review draft of its “California Climate Adaptation Strategy” report that details many vulnerabilities arising from climate change with respect to matters such as temperature extremes, sea level rise, wildfires, floods and droughts and precipitation changes. This report responds to the Governor’s Executive Order S-13-2008 that called on state agencies to develop California’s strategy to identify and prepare for expected climate impacts.

According to the reports, substantial temperature increases arising from increased GHG emissions potentially could result in a variety of impacts to the people, economy, and environment of California associated with a projected increase in extreme conditions, with the severity of the impacts depending upon actual future emissions of GHGs and associated warming. Under the emissions scenarios of the Climate Scenarios report, the impacts of global warming in California have the potential to include but are not limited to the following areas:

- Air Quality/General Thermal Effects
- Water Resources
- Agriculture
- Forest and Landscapes
- Rising Sea Levels

**Human Health Effects of GHG Emissions**

The potential health effects related directly to the emissions of carbon dioxide, methane, and nitrous oxide as they relate to development projects such as the project are still being debated in the scientific community. Their cumulative effects to global climate change have the potential to cause adverse effects to human health. Increases in Earth’s ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas.

**3.7.2 - Regulatory Setting**

**International**

**Kyoto Protocol**

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to evaluate the impacts of global warming and to develop strategies that nations could implement to curtail global climate change. In 1992, the United States joined other countries around the world in signing the United Nations’ Framework Convention on Climate Change (UNFCCC) agreement with the goal of
controlling greenhouse gas emissions. As a result, the Climate Change Action Plan was developed to address the reduction of GHGs in the United States. The Plan currently consists of more than 50 voluntary programs for member nations to adopt.

The Kyoto protocol is a treaty made under the UNFCCC and was the first international agreement to regulate GHG emissions. Some have estimated that if the commitments outlined in the Kyoto protocol are met, global GHG emissions could be reduced an estimated five percent from 1990 levels during the first commitment period of 2008-2012. Notably, while the United States is a signatory to the Kyoto protocol, Congress has not ratified the Protocol and the United States is not bound by the Protocol’s commitments. In December 2009, international leaders from 192 nations met in Copenhagen to address the future of international climate change commitments post-Kyoto.

**Federal**

**Clean Air Act**

Coinciding 2009 meeting in Copenhagen, on December 7, 2009, the U.S. Environmental Protection Agency (EPA) issued an Endangerment Finding under Section 202(a) of the Clean Air Act, opening the door to federal regulation of GHGs. The Endangerment Finding notes that GHGs threaten public health and welfare and are subject to regulation under the Clean Air Act. To date, the EPA has not promulgated regulations on GHG emissions, but it has already begun to develop them.

Previously the EPA had not regulated GHGs under the Clean Air Act because it asserted that the Act did not authorize it to issue mandatory regulations to address global climate change and that such regulation would be unwise without an unequivocally established causal link between GHGs and the increase in global surface air temperatures. In Massachusetts v. Environmental Protection Agency et al. (127 S. Ct. 1438 (2007), however, the U.S. Supreme Court held that GHGs are pollutants under the Clean Air Act and directed the EPA to decide whether the gases endangered public health or welfare.

The EPA had also not moved aggressively to regulate GHGs because it expected Congress to make progress on GHG legislation, primarily from the standpoint of a cap-and-trade system. However, proposals circulated in both the House of Representative and Senate have been controversial and it may be some time before the U.S. Congress adopts major climate change legislation. The EPA’s Endangerment Finding paves the way for federal regulation of GHGs with or without Congress.

Although global climate change did not become an international concern until the 1980s, efforts to reduce energy consumption began in California in response to the oil crisis in the 1970s, resulting in the incidental reduction of greenhouse gas emissions. In order to manage the State’s energy needs and promote energy efficiency, Assembly Bill (AB) 1575 created the California Energy Commission (CEC) in 1975.

**State**

**Title 24 Energy Standards**

The CEC first adopted Energy Efficiency Standards for Residential and Nonresidential Buildings (California Code of Regulations, Title 24, Part 6) in 1978 in response to a legislative mandate to reduce energy consumption in the State. Although not originally intended to reduce GHG emissions,
increased energy efficiency, and reduced consumption of electricity, natural gas, and other fuels would result in fewer GHG emissions from residential and nonresidential buildings subject to the standard. The standards are updated periodically to allow for the consideration and inclusion of new energy efficiency technologies and methods. The latest revisions were adopted in 2008 and became effective on January 1, 2010.

Part 11 of the Title 24 Building Standards Code is referred to as the California Green Building Standards Code (CALGreen Code). The purpose of the CALGreen Code is to “improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5) Environmental air quality.” The CALGreen Code is not intended to substitute or be identified as meeting the certification requirements of any green building program that is not established and adopted by the California Building Standards Commission. Unless otherwise noted in the regulation, all newly constructed buildings in California are subject of the requirements of the CALGreen Code.

CALGreen contains both mandatory and voluntary measures; for non-residential land uses there are 39 mandatory measures including, but not limited to exterior light pollution reduction, wastewater reduction by 20 percent, and commissioning of projects over 10,000 square feet. There are two tiers of voluntary measures for non-residential land uses, for a total of 36 additional elective measures.

California’s Building Energy Efficiency Standards are updated on an approximately three-year cycle. The 2013 Standards continue to improve upon the current 2008 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2013 Building Energy Efficiency Standards are 25 percent more efficient than previous standards for residential construction and 30 percent better for nonresidential construction. The 2013 Standards, which took effect on January 1, 2014, offers builders better windows, insulation, lighting, ventilation systems, and other features that reduce energy consumption in homes and businesses.

**California Assembly Bill No. 1493 (AB 1493)**

AB 1493 requires ARB to develop and adopt the nation’s first greenhouse gas emission standards for automobiles. The Legislature declared in AB 1493 that global warming was a matter of increasing concern for public health and environment in California. Further, the legislature stated that technological solutions to reduce greenhouse gas emissions would stimulate the California economy and provide jobs.

To meet the requirements of AB 1493, ARB approved amendments to the California Code of Regulations (CCR) adding GHG emission standards to California’s existing motor vehicle emission standards in 2004. Amendments to CCR Title 13 Sections 1900 (CCR 13 1900) and 1961 (CCR 13 1961) and adoption of Section 1961.1 (CCR 13 1961.1) require automobile manufacturers to meet fleet average GHG emission limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty passenger vehicle weight classes beginning with the 2009 model year. Emission limits are further reduced each model year through 2016.
In December 2004, a group of car dealerships, automobile manufacturers, and trade groups representing automobile manufacturers filed suit against ARB to prevent enforcement of CCR 13 1900 and CCR 13 1961 as amended by AB 1493 and CCR 13 1961.1 (Central Valley Chrysler-Jeep et al. v. Catherine E. Witherspoon, in her official capacity as Executive Director of the California Air Resources Board, et al.). The suit, heard in the U.S. District Court for the Eastern District of California, contended that California’s implementation of regulations that in effect regulate vehicle fuel economy violates various federal laws, regulations, and policies. In January 2007, the judge hearing the case accepted a request from the State Attorney General’s office that the trial be postponed until a decision is reached by the U.S. Supreme Court on a separate case addressing GHGs. In the Supreme Court Case, Massachusetts vs. EPA, the primary issue in question is whether the federal CAA provides authority for the United States Environmental Protection Agency (EPA) to regulate CO2 emissions. In April 2007, the U.S. Supreme Court ruled in Massachusetts’ favor, holding that GHGs are air pollutants under the CAA. On December 11, 2007, the judge in the Central Valley Chrysler-Jeep case rejected each plaintiff’s arguments and ruled in California’s favor. On December 19, 2007, the EPA denied California’s waiver request. California filed a petition with the Ninth Circuit Court of Appeals challenging EPA’s denial on January 2, 2008.

The Obama administration subsequently directed the EPA to re-examine their decision. On May 19, 2009, challenging parties, automakers, the State of California, and the federal government reached an agreement on a series of actions that would resolve these current and potential future disputes over the standards through model year 2016. In summary, the EPA and the U.S. Department of Transportation agreed to adopt a federal program to reduce GHGs and improve fuel economy, respectively, from passenger vehicles in order to achieve equivalent or greater greenhouse gas benefits as the AB 1493 regulations for the 2012–2016 model years. Manufacturers agreed to ultimately drop current and forego similar future legal challenges, including challenging a waiver grant, which occurred on June 30, 2009. The State of California committed to (1) revise its standards to allow manufacturers to demonstrate compliance with the fleet-average GHG emission standard by “pooling” California and specified State vehicle sales; (2) revise its standards for 2012–2016 model year vehicles so that compliance with EPA-adopted GHG standards would also comply with California’s standards; and (3) revise its standards, as necessary, to allow manufacturers to use emissions data from the federal Corporate Average Fuel Economy (CAFE) program to demonstrate compliance with the AB 1493 regulations.

**Executive Order S-3-05**

Executive Order S-3-05, which was signed by Governor Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra’s snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 1990 level by 2020, and to 80 percent below the 1990 level by 2050. The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary also is required to submit biannual reports to the Governor and state Legislature describing: (1) progress made toward reaching the emission targets; (2) impacts of global warming on California’s resources; and (3)
mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created a Climate Action Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

**California Assembly Bill 32 (AB 32)**

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020.

This reduction will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the State achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

In November 2007, ARB completed its estimates of 1990 GHG levels. Net emission 1990 levels were estimated at 427 MMT CO₂e (emission sources by sector were transportation at 35 percent, electricity generation at 26 percent, industrial at 24 percent, residential at 7 percent, agriculture at 5 percent, and commercial at 3 percent). Accordingly, 427 MMT CO₂e was established as the emissions limit for 2020. For comparison, ARB’s estimate for baseline GHG emissions was 473 MMT CO₂e for 2000 and 532 MMT CO₂e for 2010. “Business as usual” conditions (without the 30 percent reduction to be implemented by ARB regulations) for 2020 were projected to be 596 MMT CO₂e.

In December 2007, ARB approved a regulation for mandatory reporting and verification of GHG emissions for major sources. This regulation covered major stationary sources such as cement plans, oil refineries, electric generating facilities/providers, and co-generation facilities, which comprise 94 percent of the point source CO₂ emissions in the State.

On December 11, 2008, ARB adopted a scoping plan to reduce GHG emissions to 1990 levels. The Scoping Plan’s recommendations for reducing GHG emissions to 1990 levels by 2020 include emission reduction measures, including a cap-and-trade program linked to Western Climate Initiative partner jurisdictions, green building strategies, recycling and waste-related measures, as well as Voluntary Early Actions and Reductions. Implementation of individual measures must begin no later than January 1, 2012, so that the emissions reduction target can be fully achieved by 2020.
While local government operations were not accounted for in achieving the 2020 emissions reduction, local land use changes are estimated to result in a reduction of 5 MMT CO₂e, which is approximately 3 percent of the 2020 GHG emissions reduction goal. In recognition of the critical role local governments will play in successful implementation of AB 32, ARB is recommending GHG reduction goals of 15 percent of 2006 levels by 2020 to ensure that municipal and community-wide emissions match the State’s reduction target. According to the Measure Documentation Supplement to the Scoping Plan, local government actions and targets are anticipated to reduce vehicle miles by approximately 2 percent through land use planning, resulting in a potential GHG reduction of 2 MMT CO₂e (or approximately 1.2 percent of the GHG reduction target).

**California Senate Bill No. 1368 (SB 1368)**

In 2006, the State Legislature adopted Senate Bill (SB) 1368, which was subsequently signed into law by the Governor. SB 1368 directs the California Public Utilities Commission to adopt a greenhouse gas emission performance standard (EPS) 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 five 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 will effectively prevent California’s utilities from investing in, otherwise financially supporting, or purchasing power from new coal plants located in or out of the State. Thus, SB 1368 will lead to dramatically lower greenhouse gas emissions associated with California energy demand, as SB 1368 will effectively prohibit California utilities from purchasing power from out of state producers that cannot satisfy the EPS standard required by SB 1368.

**Senate Bill 97 (SB 97)**

Pursuant to the direction of SB 97, the Governor’s Office of Planning and Research (OPR) released preliminary draft CEQA Guidelines amendments for greenhouse gas emissions on January 8, 2009, and submitted its final proposed guidelines to the Secretary for Natural Resources on April 13, 2009. The Natural Resources Agency adopted the Guideline amendments and they became effective on March 18, 2010.

Of note, the new guidelines state that a lead agency shall have discretion to determine whether to use a quantitative model or methodology, or in the alternative, rely on a qualitative analysis or performance-based standards. CEQA Guideline Section 15064.4(a) states:

A lead agency shall have discretion to determine, in the context of a particular project, whether to: (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use . . .; or (2) Rely on a qualitative analysis or performance based standards.

CEQA emphasizes that the effects of greenhouse gas emissions are cumulative, and should be analyzed in the context of CEQA’s requirements for cumulative impacts analysis (see CEQA Guidelines Section 15130(f)).
Section 15064.4(b) of the CEQA Guidelines provides direction for lead agencies for assessing the significance of impacts of greenhouse gas 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 greenhouse gas 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.

**Executive Order S-01-07**

On January 18, 2007, California Governor Arnold Schwarzenegger, through Executive Order S-01-07, mandated a statewide goal to reduce the carbon intensity of California’s transportation fuel by at least ten percent by 2020. The order also requires that a California specific Low Carbon Fuel Standard be established for transportation fuels.

**Senate Bills 1078 and 107 and Executive Order S-14-08**

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010. In November 2008 Governor Schwarzenegger signed Executive Order S-14-08, which expands the State’s Renewable Energy Standard to 33 percent renewable power by 2020.

**Senate Bill 375**

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires metropolitan planning organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPO’s
regional transportation plan. ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO’s SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects will not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required being consistent with the regional transportation plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as “transit priority projects.”

South Coast Air Quality Management District Recommendations for Significance Thresholds
In April 2008, the South Coast Air Quality Management District (SCAQMD), in order to provide guidance to local lead agencies on determining the significance of GHG emissions identified in CEQA documents, convened a “GHG CEQA Significance Threshold Working Group.” The goal of the working group is to develop and reach consensus on an acceptable CEQA significance threshold for GHG emissions that would be utilized on an interim basis until ARB (or some other state agency) develops statewide guidance on assessing the significance of GHG emissions under CEQA.

Initially, SCAQMD staff presented the working group with a significance threshold that could be applied to various types of projects—residential, non-residential, industrial, etc. However, the threshold is still under development. In December 2008, staff presented the SCAQMD Governing Board with a significance threshold for industrial projects where it is the lead agency. This threshold uses a tiered approach to determine a project’s significance, with 10,000 MT CO2e as a screening numerical threshold for industrial projects.

Local

City of Orange
General Plan
The City of Orange General Plan sets forth the following goal and policies that are relevant to greenhouse gas emissions:

- **Goal 3.0**: Prepare for and adapt to the effects of climate change and promote practices that decrease the City’s contribution to climate change.
- **Policy 3.1**: Evaluate the potential effects of climate change on the City’s human and natural systems and prepare strategies that allow the City to appropriately respond and adapt.
- **Policy 3.2**: Develop and adopt a comprehensive strategy to reduce greenhouse gasses (GHGs) within Orange by at least 15 percent from current levels by 2020.
3.7.3 - 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. The project would generate significant impacts with respect to GHGs if it would:

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.)

On December 5, 2008, the SCAQMD Governing Board adopted interim GHG significance thresholds. Although these thresholds are still “interim” thresholds at the time of this analysis, the thresholds represent the most applicable thresholds supported by substantial evidence. These thresholds are widely accepted by lead agencies in the region and by SCAQMD. The current SCAQMD interim thresholds are administered through the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA;
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant greenhouse gas emissions;
- Tier 3 consists of screening values, and the lead agency can choose either option #1 or option #2, but must be consistent with all projects within its jurisdiction. A project’s construction emissions are averaged over 30 years and are added to a project’s operational emissions. If a project’s emissions are under one of the following screening thresholds, then the project is less than significant:
  - Option #1: All residential or commercial land use types: 3,000 metric tons of carbon dioxide equivalents (MT CO₂e) per year and industrial land uses: 10,000 MT CO₂e, or
  - Option #2: Based on land use type—residential: 3,500 MT CO₂e per year; commercial: 1,400 MT CO₂e per year; industrial: 10,000 MT CO₂e; or mixed use: 3,000 MT CO₂e per year

- Tier 4 has the following options:
  - Option 1: Reduce emissions from business as usual by a certain percentage; this percentage is currently undefined;
  - Option 2: Early implementation of applicable AB 32 Scoping Plan measures;
  - Option 3, 2020 target for service populations (SP), which includes residents and employees: 4.8 MT CO₂e/SP/year for projects and 6.6 MT CO₂e/SP/year for plans; 2035 target: 3.0 MT CO₂e/SP/year for projects and 4.1 MT CO₂e/SP/year for plans.

- Tier 5 involves mitigation offsets to achieve target significance threshold.
If a project generates GHG emissions below the applicable thresholds described above, its GHG emissions would be considered a less than significant impact on the environment. To determine whether the project is significant, this analysis uses the residential-specific draft SCAQMD threshold:

- 3,500 MT CO$_2$e per year for annual operational emissions and amortized construction emissions.

### 3.7.4 - 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: | The project would not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. |

**Impact Analysis**

Project-related GHG emissions would include emissions from direct and indirect sources. The project would result in direct and indirect emissions from construction activities, area sources, and mobile sources. The CalEEMod model (Version 2016.3.1) was used to estimate GHG emissions resulting from the project’s construction and operational activities.

The project would involve the construction of single-family residential units on the project site. Construction-related GHG emissions are primarily generated from fossil fuel combustion associated with construction equipment, material delivery trucks, and construction worker vehicles.

Operational GHG emissions are generated by the following emission sources:

- 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 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; and
- Waste—These emissions refer to the GHG emissions produced by decomposing waste generated by the project.

A summary of the estimated emissions that would result from the construction equipment is shown Table 3.7-3. The amortized construction emissions were added to annual operational emissions to compare with SCAQMD’s applicable threshold of significance.
Table 3.7-3: Construction Greenhouse Gas Emissions—Unmitigated

<table>
<thead>
<tr>
<th>Construction Activity</th>
<th>MT CO₂e</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Preparation</td>
<td>27</td>
</tr>
<tr>
<td>Grading</td>
<td>2,279</td>
</tr>
<tr>
<td>Building Construction—2019</td>
<td>824</td>
</tr>
<tr>
<td>Building Construction—2020</td>
<td>649</td>
</tr>
<tr>
<td>Paving</td>
<td>29</td>
</tr>
<tr>
<td>Architectural Coating</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total Construction Emissions</strong></td>
<td>3,817</td>
</tr>
</tbody>
</table>

Amortized over 30 years¹ 127

Note:

¹ Construction greenhouse gas emissions are amortized over the 30-year life of the project (= 3,817/30).
Source: CalEEMod Output (see Appendix B)

Table 3.7-4 presents the project’s annual long-term operational emissions by emissions source. The sum of annual operational emissions and amortized construction emissions are compared with the applicable threshold of significance.

Table 3.7-4: Operational Greenhouse Gas Emissions-Unmitigated

<table>
<thead>
<tr>
<th>Emissions Source</th>
<th>Emissions (MT CO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>2</td>
</tr>
<tr>
<td>Energy</td>
<td>570</td>
</tr>
<tr>
<td>Mobile</td>
<td>720</td>
</tr>
<tr>
<td>Waste</td>
<td>77</td>
</tr>
<tr>
<td>Water</td>
<td>160</td>
</tr>
<tr>
<td>Amortized Construction</td>
<td>127</td>
</tr>
<tr>
<td><strong>Total Project Emissions</strong></td>
<td>1,656</td>
</tr>
<tr>
<td>SCAQMD Threshold</td>
<td>3,500</td>
</tr>
</tbody>
</table>

Exceed Significant? No

Note:

MT CO₂e = metric tons of carbon dioxide equivalent
Source of emissions: CalEEMod Output (see Appendix A).
Source of thresholds: SCAMD 2008c.
As shown in Table 3.7-4, the proposed project would generate 1,656 \( \text{MT CO}_2\text{e} \) per year, which would not exceed the applicable SCAQMD’s draft thresholds of 3,500 \( \text{MT CO}_2\text{e} \). Therefore, the project’s long-term GHG emissions (along with amortized construction emissions) would not result in significant impact on the environment.

**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 Plan, Policy, or Regulation that Reduces Emissions**

| Impact GHG-2: | The project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. |

**Impact Analysis**
At the time of this analysis, the City of Orange (the City) has not yet adopted a GHG reduction plan that the project can be evaluated against. However, as part of the City of Orange’s 2010 General Plan, the Natural Resources Element includes goals for climate change listed below.¹

- **Goal 3.0:** Prepare for and adapt to the effects of climate change and promote practices that decrease the City’s contribution to climate change.
- **Policy 3.1:** Evaluate the potential effects of climate change on the City’s human and natural systems and prepare strategies that allow the City to appropriately respond and adapt.
- **Policy 3.2:** Develop and adopt a comprehensive strategy to reduce greenhouse gases (GHGs) within Orange by at least 15 percent from current levels by 2020.

The project would be consistent with the General Plan designation for the project site for “Low Density Residential,” “Resource Area,” and “Open Space.” Thus, the project would help preserve areas of the City designated for “Resource Area” and “Open Space,” which would be consistent with Goal 3.0 to decrease the City’s contribution to climate change. In other words, by preserving a majority of the project site as open space and recreational uses, the project would avoid additional GHG emissions from those areas and provide recreational opportunities to the proposed and nearby existing residents. Furthermore, the project site is located in an infill area, which would add residential density to the local area. The increased density of the local neighborhood would help support the South California Association of Governments’ (SCAG) regional land use and transportation GHG reduction goals mandated by SB 375, which relies on additional residential density coupled with nearby amenities to reduce vehicle miles traveled and encourage alternative modes of transportation.

Given that the project would comply with the land use designations of the project site, increase residential density in a developed area, and preserve open space and recreational land—which would reduce GHG emissions produced on those areas—it is not anticipated that the project would conflict with an applicable GHG reduction plan. Furthermore, as described in Impact GHG-1, the project’s long-term operational and amortized construction emissions would not exceed the applicable SCAQMD’s threshold of significance. Although these thresholds had not been formally adopted at the time of this analysis, they are considered the allowable amount of emissions for each project, under which the project would not impede regional and state GHG reduction goals. Therefore, considering the aforementioned information, it is not anticipated that the project would conflict with the applicable GHG reduction plan. Therefore, this impact 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.
3.8 - Hazards and Hazardous Materials

3.8.1 - 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 Phase I Environmental Site Assessment prepared by Michael Brandman Associates and the Phase II Environmental Site Assessment prepared by Tait Environmental Services. Both reports are provided in Appendix F.

3.8.2 - Environmental Setting

Hazardous Materials

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.

Phase I/II Environmental Site Assessments

Three previous Phase I or Phase II Environmental Site Assessments (Phase I/II ESAs) were prepared for the project site in 2000, 2009, and 2011. Because the 2009 Phase I ESA was prepared after the 2000 Phase I ESA, it provided a more accurate and current assessment of potential hazards and, thus its findings take precedence. The findings of the 2009 Phase I ESA and 2011 Phase II ESA are summarized in Table 3.8-1.
### Table 3.8-1: Previous Phase I/II Environmental Site Assessment Findings

<table>
<thead>
<tr>
<th>Firm</th>
<th>Findings</th>
</tr>
</thead>
</table>
| Michael Brandman Associates—Phase I ESA (2009) | 1. All appropriate safeguards and analysis shall be conducted to mitigate any potential risks associated with the proposed project in regards to the adjacent former Villa Park Landfill. California Code of Regulations (CCR), Title 27, Section 21190, Postclosure Land Use applies to all construction within 1,000 feet of the boundary of any disposal area to prevent gas migration into buildings. Examples of safeguards include a geomembrane between the concrete floor slab and subgrade; periodic methane gas monitoring inside all buildings and underground utilities; a subsurface venting system beneath each building; and automatic methane sensors beneath and inside each building. (CCR Title 27, Section 21190 is included as an attachment to the County of Orange Health Care Agency correspondence contained in Appendix E.) Compatibility of proposed project land uses within 1,000 feet of the boundary of the former Villa Park Landfill shall be properly evaluated.  
2. Design plans for: 1) any occupied structures within 1,000 feet of the landfill boundary; and 2) structural systems to prevent gas-related hazards are required to be reviewed and approved by the County of Orange Health Care Agency/Local Enforcement Agency.  
3. The proposed occupied structures shall be situated strategically to allow for future remediation of any potential landfill gas migration.  
4. Prior to commencement of any construction activities that would impact the landfill or related gas monitoring equipment, the City Engineer shall consult with and obtain approval from the Orange County Integrated Waste Management Department for the relocation of any monitoring wells or probes that would be impacted by development on the project site.  
5. Mitigation Measures 5.6-1 through 5.6-5, as outlined in the EIR for the Sully Miller Fieldstone Communities Project, Hazards and Hazardous Materials Section 5.6, shall be incorporated into proposed project design and Mitigation Monitoring and Reporting Program.  
6. Written and verbal disclosures regarding landfill gas shall be provided to lot and homeowners within 1,000 feet of the landfill boundary.  
7. All environmental investigations, sampling and/or remediation for the project site shall be conducted under a Workplan approved and overseen by a regulatory agency with jurisdiction to oversee hazardous substance cleanup.  
8. Further testing and analysis shall be conducted for the on-site Potential Areas of Environmental Concern identified in Section 7.1 of the 2000 Geomatrix Phase I ESA that have not yet been addressed and remediated:  
   - Soils beneath the former diesel-affected soil stockpile located previously at the western end of the site: Concentrations of total petroleum hydrocarbons quantified against a diesel standard (TPHd) occurring above the regulatory clean-up level of 1,000 mg/kg.  
   - Soils within the western sidewall of a former emulsion tank UST excavation located in the central portion of the site: Concentrations of TPHd slightly above the regulatory clean-up level.  
   - On-site areas that previously included agriculture: Level of pesticide and herbicide residue in the soil.  
   - Asbestos or asbestos-containing materials: Reportedly buried on-site within a designated area. |
<table>
<thead>
<tr>
<th>Firm</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tait Environmental Services—Phase II ESA (2011)</td>
<td>1. One soil vapor sample (C-6-5@15’) collected in Planning Area C contained trichloroethylene (TCE) at a concentration that could potentially pose a significant human health risk to users of residential buildings located in the area where sample C-6-5@15’ was collected. Mitigation and/or remedial actions to address potential vapor intrusion risks to residential users’ potential risk may be needed. The need for the mitigation and/or remedial actions will depend on the final grade elevations for the area of concern (the greater the distance between the detected TCE-impacted soil vapor and the final grade, the less chance that mitigation and/or remedial actions will be required). Mitigation measures could include vapor barriers or passive/active venting systems beneath Site buildings in the affected area. Remedial actions could include mechanical stripping of TCE-impacted soil in the affected area.</td>
</tr>
<tr>
<td></td>
<td>2. Five soil vapor samples (C-1-1@15’, C-1-3@15’, C-1-6@8’, C-3-2@15’, and C-6-7@15’) collected in Planning Area C contained methane at concentrations below one percent by volume. The possibility exists that this methane could infiltrate future Site buildings in the affected areas and concentrate in rooms with limited air exchanges. Should this occur, the methane concentration could exceed its lower explosive limit (5% by volume), creating a potentially explosive mixture. Mitigation and/or remedial actions to address this potential risk may be needed. The need for the mitigation and/or remedial actions will depend on the final grade elevations for the area of concern (the greater the distance between the detected methane containing soil vapor and the final grade, the less chance that mitigation and/or remedial actions will be required). Mitigation measures could include vapor barriers or passive/active venting systems beneath Site buildings in the affected area. Remedial actions could include mechanical stripping of methane-containing soil vapor in the affected areas.</td>
</tr>
<tr>
<td></td>
<td>3. None of the soil matrix core samples collected at the Site contained detectable concentrations of VOCs or pesticide compounds that could potentially pose a significant human health risk to future Site users. Accordingly, TAIT makes no recommendation for remedial actions and/or mitigation measures.</td>
</tr>
<tr>
<td></td>
<td>4. Fourteen soil matrix core samples (A-5-3@5’, C-1-1@5’, C-1-1 @10’, C-1-3@5’, C-1-3@10’, C-1-4@5’, C-1-4@8’, C-1-5@5’, C-1-5@8’, C-1-6@5’, C-3-1@5’, C-3-1@10’, C-3-2@5’, and C-3-2@10’) collected in Planning Areas C and D (both planned residential areas) contained TPH-mo at concentrations that exceeded the respective ESL. Nine of these samples also contained TPH-d at concentrations exceeding the respective ESL. Remedial actions to address potential soil ingestion and dermal contact risk to future Site users may be needed. The need for the remedial actions will depend on final surface cover and final grade elevations for the areas of concern (the greater the distance between the detected TPH-impacted soil and the final grade, the less chance that remedial actions will be required). Remedial actions could include excavation and off-site disposal.</td>
</tr>
</tbody>
</table>

Source: FCS, 2016.

It should be noted that the 2011 Tait Phase II ESA was prepared to address the findings of the 2009 Phase I ESA by way of subsurface investigation and sampling and, thus, its findings are most relevant.
in terms of identifying potential hazards to future occupants and users of the site. The key findings and potential risks from the 2011 Tait Phase II ESA are as follows:

- Potential vapor intrusion of trichloroethylene (TCE) and methane into future dwelling units
- Elevated petroleum hydrocarbon concentrations in soil

Tait Environmental Services determined that all other potential hazards and hazardous materials that may have previously been located on the project site as indicated by the 2000 and 2009 Phase I ESAs no longer exist, including asbestos.

**Database Search**

FCS performed a search of the State Water Resources Control Board GeoTracker database to identify known hazardous materials sites in the project vicinity. The results are summarized in Table 3.8-2.

<table>
<thead>
<tr>
<th>Site</th>
<th>Address</th>
<th>Relationship to Project Site</th>
<th>Database(s)</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villa Park Landfill</td>
<td>5545 E. Santiago Canyon Road</td>
<td>Adjacent (west)</td>
<td>Land Disposal Site</td>
<td>Closed With Monitoring (2014)</td>
</tr>
<tr>
<td>Orange County Fire</td>
<td>5020 E. Santiago</td>
<td>0.25 mile (southwest)</td>
<td>LUST Cleanup Site</td>
<td>Closed (1999)</td>
</tr>
<tr>
<td>Station No. 23</td>
<td>Canyon Road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diocese of Orange</td>
<td>7845 E. Santiago</td>
<td>0.5 mile (east)</td>
<td>LUST Cleanup Site</td>
<td>Closed (1999)</td>
</tr>
<tr>
<td></td>
<td>Canyon Road</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3.8-2: GeoTracker Search Results Summary

Note:
LUST = Leaking Underground Storage Tank

The site of most concern to the project site is the adjacent Villa Park Landfill, which is discussed in detail in the following section. The remaining two sites were leaking underground tank sites that are listed as “Closed” signifying that they have been remediated to the satisfaction of the regulatory agency.

**Villa Park Landfill**

The Villa Park Landfill site was originally a sand and gravel mine until 1962 when the site was repurposed as a landfill. The Villa Park Landfill was operated by Orange County (OC) Waste & Recycling as a Class III municipal solid waste landfill from 1962 to 1966. The landfill property is approximately 18 acres, of which approximately 11 acres were used for waste disposal. The landfill was closed in 1966 in accordance with closure regulation in effect at the time. OC Waste & Recycling has since been implementing post-closure monitoring and maintenance of the Villa Park Landfill.

The Villa Park Landfill is not equipped with an engineered artificial liner or with a leachate collection and removal system because this landfill predates regulatory requirements for these measures. An active gas collection system has been installed at the site to control, collect, and flare landfill gas.
generated in the buried refuse. Groundwater monitoring, vadose zone perimeter gas probe monitoring, and site maintenance is conducted by OC Waste & Recycling on a regular basis.

**Hazardous Building Materials**

**Asbestos**

Asbestos is the name given to a number of naturally occurring, fibrous silicate minerals mined for their useful properties, such as thermal insulation, chemical and thermal stability, and high tensile strength. Asbestos is commonly used as an acoustic insulator, thermal insulation, fireproofing, and in other building materials. Asbestos is made up of microscopic bundles of fibers that may become airborne when asbestos-containing materials are damaged or disturbed. When these fibers get into the air, they may be inhaled into the lungs, where they can cause significant health problems. The California Occupational Health and Safety Administration (CalOSHA) defines asbestos-containing construction materials as any material that contains more than 0.1 percent asbestos by weight.

The Phase II ESA determined that asbestos is not present on the project site.

**Lead**

Lead is a highly toxic metal that was used until the late 1970s in a number of products, most notably in paint. Lead may cause a range of health effects, from behavioral problems and learning disabilities to seizures and death. Primary sources of lead exposure are deteriorating lead-based paint, lead-contaminated dust, and lead-contaminated soil. Both the United States Environmental Protection Agency (EPA) and the California Department of Health Services define lead paint as containing a minimum of 0.5 percent lead by weight. Lead-containing waste materials with a concentration greater than 0.1 percent are considered hazardous waste by California law. Both the federal and California OSHA maintain regulations regarding the disturbance of paints that contain any amount of lead.

The Phase II ESA determined that lead-containing materials are not present on the project site.

**Materials Recycling**

Approximately 5 acres in the southeastern portion of the project site are used as a materials recycling area. Within this area, an apparatus was used for the crushing of boulders, bricks, rocks, etc. for recycling. Additionally, operations that provide for the cement treatment of base materials occurred within this area. Access to the materials recycling area is from a controlled entrance along East Santiago Canyon Road. Historically, the materials generated by this operation have been used on and transported off the project site.

**Backfilling Operation**

The project site has been previously backfilled as a permitted use to restore previously mined portions of the site. As previously noted, the project site was used from 1919 to 1995 for surface mining of sand, gravel, and other aggregates. Previously mined portions of the project site were used for residue silt deposition, otherwise known as silt ponds. The backfilling operation addressed both mined and silt pond areas.
Radon

Radon is a carcinogenic radioactive gas resulting from the natural breakdown of uranium in soil, rock, and water. Radon gas enters a building through cracks in foundations and walls. Once inside the building, radon decay products may become attached to dust particles and inhaled, or the decayed radioactive particles alone may be inhaled and cause damage to lung tissue. The EPA has established safe radon exposures to threshold of 4 picocuries per liter of air (pCi/l). Table 3.8-3 summarizes indoor radon test results for several zip codes in the project vicinity.

Table 3.8-3: Indoor Radon Testing Summary

<table>
<thead>
<tr>
<th>Zip Code (Area)</th>
<th>Total Indoor Radon Samples</th>
<th>No. Exceeding 4.0 pCi/l</th>
<th>Percent Exceeding 4.0 pCi/l</th>
</tr>
</thead>
<tbody>
<tr>
<td>92807 (Anaheim Hills)</td>
<td>59</td>
<td>5</td>
<td>8.5</td>
</tr>
<tr>
<td>92861 (Villa Park)</td>
<td>12</td>
<td>4</td>
<td>33.3</td>
</tr>
<tr>
<td>92867 (Orange)</td>
<td>49</td>
<td>4</td>
<td>8.2</td>
</tr>
<tr>
<td>92869 (Orange Park Acres)*</td>
<td>39</td>
<td>1</td>
<td>2.6</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>14</td>
<td>8.8</td>
</tr>
</tbody>
</table>

Note:  
* Project site is located in the 92869 zip code.  
Source: California Department of Public Health, 2016.

As shown in Table 3.8-3, the California Department of Public Health has conducted 159 indoor radon tests in four zip codes in the project vicinity. Of this figure, 14 yield concentrations in excess of 4.0 pCi/l, which is equivalent to 8.8 percent. The California Department of Public Health indicates that areas between 7.0 to 20.0 percent have a “moderate” radon potential.

3.8.3 - Regulatory Framework

Federal

Hazardous Materials Laws

The EPA is the lead agency responsible for enforcing federal laws and regulations governing hazardous materials that affect public health or the environment. The major federal laws and regulations enforced by the EPA include the Resource Conservation and Recovery Act (RCRA), the Toxic Substances Control Act, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Superfund Amendments and Reauthorization Act.

In 1976, the RCRA was enacted to provide a general framework for the EPA to regulate hazardous waste from the time it is generated until its ultimate disposal. In accordance with RCRA, facilities that generate, treat, store, or dispose of hazardous waste are required to ensure that the wastes are properly managed from “cradle to grave.”

Also in 1976, the Toxic Substances Control Act was enacted to provide the EPA authority to regulate the production, importation, use, and disposal of chemicals that pose a risk of adversely impacting...
public health and the environment, such as polychlorinated biphenyls (PCBs), asbestos-containing materials, and lead-based paint. The Toxic Substances Control Act also gives the EPA authority to regulate the cleanup of sites contaminated with specific chemicals, such as PCBs.

In 1980, CERCLA, commonly known as the Superfund, was enacted to ensure that a source of funds was available for the EPA to remediate uncontrolled or abandoned hazardous materials release sites that pose a risk of adversely impacting public health and the environment. Prohibitions and requirements regarding closed or abandoned hazardous waste sites and liability standards for responsible parties were also established by CERCLA. In 1986, the Superfund Amendments and Reauthorization Act amended CERCLA to increase the Superfund budget, modify contaminated site cleanup criteria and schedules, and revise settlement procedures.

Other relevant federal laws include the Hazardous and Solid Waste Amendments Act regarding hazardous waste management; the Toxic Substances Control Act, pertaining to the tracking and screening of industrial chemicals; and the Federal Insecticide, Fungicide, and Rodenticide Act, which controls pesticide distribution, sale, and use. Applicable federal regulations and guidelines are contained primarily in Code of Federal Regulations (CFR) Titles 10, 29, 40, and 49.

**Comprehensive Environmental Response, Compensation and Liability Act**

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 introduces active Federal involvement to emergency response, site remediation, and spill prevention, most notably with the Superfund program. The Act was intended to be comprehensive in encompassing both the prevention of and response to uncontrolled hazardous substances releases. The Act deals with environmental response, providing mechanisms for reacting to emergencies and chronic hazardous material releases. In addition to establishing procedures to prevent and remedy problems, it establishes a system for compensating appropriate individuals and assigning appropriate liability. It is designed to plan for, and respond to, failure in other regulatory programs and to remedy problems resulting from action taken before the era of comprehensive regulatory protection.

**State**

**California Health and Safety Code**

The California Environmental Protection Agency (CalEPA) has established rules governing the use of hazardous materials and the management of hazardous wastes. California Health and Safety Code Sections 25531, et seq. incorporates the requirements of Superfund Amendments and Reauthorization Act and the Clean Air Act as they pertain to hazardous materials. Health and Safety Code Section 25534 directs facility owners storing or handling acutely hazardous materials in reportable quantities to develop a Risk Management Plan. The plan must be submitted to the appropriate local authorities, the designated local administering agency, and the EPA for review and approval.
CEQA and the Cortese List

The Cortese List (Hazardous Waste and Substances Site List) is a planning document used by the State, local agencies, and developers to comply with CEQA requirements to consider Government Code Section 5962.5 in evaluating proposed development projects. Section 65962.5 states that:

The list should contain all hazardous waste facilities subject to corrective action, all hazardous waste property or border zone property designations, all information received on hazardous waste disposals on public land, all hazardous substance release sites listed pursuant to Government Code Section 25356, and all sites that were included in the former Abandonment Site Assessment Program.

California Environmental Protection Agency (CalEPA)

Government Code Section 65962.5 requires CalEPA to develop a Cortese List at least annually. The Department of Toxic Substances Control (DTSC) is responsible for a portion of the information on the list, and other local and state government agencies are required to provide additional information. CalEPA operates the Air Resources Board, the Department of Pesticide Regulation, the DTSC, the Integrated Waste Management Board, the Office of Environmental Health Hazard Assessment, and the State Water Resources Control Board (SRWQCB). The function of each of these six offices is discussed below.

Air Resources Board (ARB): To promote and protect public health, welfare, and ecological resources through the effective and efficient reduction of air pollutants in recognition and consideration of the effects on the economy of the State.

Department of Pesticide Regulation (DPR): Regulates all aspects of pesticide sales and use to protect the public health and the environment for the purpose of evaluating and mitigating impacts of pesticide use, maintaining the safety of the pesticide workplace, ensuring product effectiveness, and encouraging the development and use of reduced-risk pest control practices.

Department of Toxic Substances Control (DTSC): The Department’s mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality by regulating hazardous waste, conducting and overseeing cleanups, and developing and promoting pollution prevention. DTSC protects residents from exposures to hazardous wastes. DTSC operates programs to:

- Deal with the aftermath of improper hazardous waste management by overseeing site cleanups.
- Prevent releases of hazardous waste by ensuring that those who generate, handle, transport, store, and dispose of wastes do so properly.
- Take enforcement actions against those who fail to manage hazardous wastes appropriately.
- Explore and promote means of preventing pollution, and encourage reuse and recycling.
- Evaluate soil, water, and air samples taken at sites, and develop new analytical methods.
Cal Recycle: Protects the public health and safety and the environment through waste prevention, waste diversion, and safe waste processing and disposal. Cal Recycle is responsible for managing California’s solid waste stream. Cal Recycle is helping California divert waste from landfills by:

- Developing waste reduction programs.
- Providing public education and outreach.
- Assisting local governments and businesses.
- Fostering market development for recyclable materials.
- Encouraging used oil recycling.
- Regulating waste management facilities.
- Cleaning up abandoned and illegal dumpsites.

Office of Environmental Health Hazard Assessment (OEHHA): The OEHHA is responsible for developing and providing risk managers in state and local government agencies with toxicological and medical information relevant to decisions involving public health. OEHHA also works with federal agencies, the scientific community, industry, and the general public on issues of environmental as well as public health. Specific examples of OEHHA responsibilities include:

- Developing health-protective exposure standards for air, water, and land to recommend to regulatory agencies, including ambient air quality standards for the Air Resources Board and drinking water chemical contaminant standards for the Department of Health Services.
- Assessing health risks to the public from air pollution, pesticide and other chemical contamination of food, seafood, drinking water, and consumer products.
- Providing guidance to local health departments, environmental departments, and other agencies with specific public health problems, including appropriate actions to take in emergencies that may involve chemicals.

State Water Resources Control Board (SWRCB): Preserves and enhances the quality of California’s water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations. The SRWQCB maintains the Leaking Underground Storage Tank Information System Database, which contains information on registered leaking underground storage tanks in the State.

California Occupational Safety and Health Agency (CalOSHA)
CalOSHA sets and enforces standards that insure safe and healthy working conditions for California’s workers. The Division of Occupational Safety & Health is charged with the jurisdiction and supervision over workplaces in California that are not under federal jurisdiction. CalOSHA regulates issues involving unsafe workplace conditions, worker exposure to chemicals, illness due to workplace exposure, or improper training.
Local

City of Orange

General Plan

The City of Orange General Plan sets forth the following goals and policies relevant to hazards and hazardous materials.

Public Safety Element

- **Goal 4.0**: Minimize risks to life, property, and the environment associated with producing, using, storing, or transporting hazardous materials.
- **Policy 4.1**: Assess the potential risks of disposing, transporting, manufacturing and storing existing hazardous materials, and develop appropriate mitigation measures in case of accidents.
- **Policy 4.2**: Prohibit new disposal, transport, manufacture, and storage of hazardous materials within the City without a mitigation plan in case of accidents. Hospitals meeting current state and federal standards are exempt.
- **Policy 4.3**: Identify hazardous materials dumpsites, and ensure that the sites are cleaned in conformance with applicable federal and state laws prior to the establishment of new uses.
- **Policy 4.4**: Ensure that the public is protected from fires, noxious fumes, and other hazards within the City’s industrial area.
- **Goal 8.0**: Emphasize emergency preparedness both within City Hall and throughout the community.
- **Policy 8.1**: Sponsor and support public education programs for emergency preparedness and disaster response.
- **Policy 8.2**: Coordinate disaster preparedness with other public and private agencies.
- **Policy 8.3**: Coordinate emergency response and preparedness planning with other cities and public agencies in the region.
- **Policy 8.4**: Develop and maintain a fully functioning Emergency Operations Center, and adequate and up-to-date emergency preparedness resources and plans.

3.8.4 - Methodology

The following analysis is based, in part, on the City of Orange General Plan, the City of Orange General Plan EIR, and a database search conducted by FCS on December 14, 2016. The information obtained from these resources and other relevant materials was reviewed and evaluated to establish potential presence of hazards and hazardous materials on the project site.

Three previous Phase I or Phase II Environmental Site Assessments (Phase I/II ESAs) were prepared for the project site in 2000, 2009, and 2011. Because the 2009 Phase I ESA was prepared after the 2000 Phase I ESA, it provided a more accurate and current assessment of potential hazards and, thus its findings take precedence. The 2009 Phase I ESA and 2011 Phase II ESA are provided in Appendix F.

3.8.5 - 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? (Refer to Section 7, Effects Not To Be Significant.)

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? (Refer to Section 7, Effects Not To Be Significant.)

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?

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.

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 construction of the residential area and related infrastructure, staging areas, trail, and other proposed improvements, hazardous materials would be handled on the project site. These hazardous materials would include gasoline, diesel fuel, lubricants, and other petroleum-based products used to operate and maintain construction equipment and vehicles. This handling of hazardous materials would be a temporary activity and coincide with the short-term construction phase of the proposed project. Although hazardous materials associated with the operation and maintenance of construction equipment and vehicles may be stored on the project site, it is
expected that only the amounts needed would be kept on-site, and any handling of such materials will be limited in both quantities and concentrations. Removal and disposal of hazardous materials from the project site would be conducted by a permitted and 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, Caltrans, and the local Hazardous Materials Program. 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 handled 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 maintenance activities. These types of materials are common and represent a low risk to people and the environment when used as intended. 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.

**Risk of Upset**

| Impact HAZ-2: | The project may 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 previously supported agricultural and mining activities and is adjacent to the closed Villa Park Landfill. Therefore, there is the potential that the development and operation of the proposed project may expose persons to hazards from these past uses.

As previously discussed, Tait Environmental Services conducted a Phase II ESA of the project site that evaluated potential exposure to hazardous materials from the past land use activities and the neighboring landfill. Tait Environmental Services found that there was the potential for (1) vapor intrusion of TCE and methane into future dwelling units and (2) elevated levels of Total Petroleum Hydrocarbons in soil. However, the proposed occupied structures will be situated strategically to allow for future remediation of any potential landfill gas migration, consistent with the California Department of Toxic Substances Control (DTSC) or other applicable regulatory agency. Accordingly,
Mitigation Measures HAZ-2a to HAZ-2c are proposed to abate these conditions to a level of less than significant.

The project site is located in a “moderate” area for indoor radon exposure in excess of 4.0 pCi/l. Indoor radon exposure is most susceptible in subsurface, enclosed spaces such as basements or parking garages. The proposed residential uses are anticipated to employ conventional slab on-grade construction and would not feature subsurface, enclosed spaces. As such, impacts related to radon would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM HAZ-2a**  The proposed occupied structures shall be situated strategically to allow for future remediation of any potential landfill gas migration. Prior to issuance of building permits for dwelling units in areas of the project site where vapor intrusion has the potential to occur, the applicant shall prepare and submit plans to the City of Orange identifying vapor intrusion abatement measures for trichloroethylene (TCE) and methane. Areas where vapor intrusion has the potential to occur are those identified in the Phase II Environmental Site Assessment. Such abatement measures may include but are not limited to vapor barriers or passive/active venting systems, as determined by the appropriate regulatory agency. The approved abatement measures shall be incorporated into project building plans. Design plans for: 1) any occupied structures within 1,000 feet of the landfill boundary; and/or 2) structural systems to prevent gas-related hazards are required to be reviewed and approved by the County of Orange Health Care Agency/Local Enforcement Agency.

**MM HAZ-2b**  Prior to issuance of grading permits, the project applicant shall retain a qualified hazardous materials contractor to remove all soil containing Total Petroleum Hydrocarbons in excess of residential development standards set forth by the California Department of Toxic Substances Control (DTSC) or other applicable regulatory agency. Soil removal and disposal shall occur in accordance with DTSC (or other applicable agency) guidelines. The applicant shall submit documentation to the City of Orange in the form of confirmatory soil sampling results verifying that this mitigation measure was successfully implemented as part of the grading permit application for this property. All environmental investigations, sampling and/or remediation for the project site shall be conducted under a workplan approved and overseen by a regulatory agency with jurisdiction to oversee hazardous substance cleanup.

**MM HAZ-2c**  Prior to commencement of any construction activities that would impact existing landfill or related gas monitoring equipment, the project applicant shall contact the City Engineer to consult with and obtain approval from the Orange County Integrated Waste Management Department for the relocation of any monitoring wells or probes that would be impacted by development on the project site.
**Level of Significance After Mitigation**
Less than significant impact.

**Exposure of Schools to Hazardous Materials**

**Impact HAZ-3:** The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

**Impact Analysis**
The Salem Lutheran Church and School (6500 E. Santiago Canyon Road, Orange, CA 92869) is located within 0.25 mile of the project site. The proposed project would develop residential, open space, and recreational uses on the project site. None of these uses would involve routine use of hazardous or acutely hazardous materials, substances or waste. Additionally, the proposed project’s uses would not involve activities that would routinely emit toxic air contaminants (e.g., diesel particulate matter).

In summary, the proposed land uses and development within 0.25 mile of an existing or proposed school would not emit or handle substantial amounts of hazardous materials or waste. 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.

**Government Code Section 65962.5 Hazardous Materials Sites**

**Impact HAZ-4:** The project may 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 closed Villa Park Landfill is immediately adjacent to the project site and is listed on hazardous materials databases compiled pursuant to Government Code Section 65962.5. The landfill employs an active gas collection system to control, collect, and flare landfill gas generated in the buried refuse. Because of its age, the landfill is unlined and does not have a leachate collection and removal system. OC Waste & Recycling conducts groundwater monitoring, vadose zone perimeter gas probe monitoring, and site maintenance.
As previously discussed, the Phase II ESA indicated that elevated levels of methane had the potential to occur in project site soils and set forth recommended mitigation (see Mitigation Measure HAZ-2a) to abate this hazard to a level of less than significant.

Finally, the proposed project would locate open space and recreation uses within the portion of the site that abuts the Villa Park Landfill. These uses would serve as a buffer between the former landfill and the residential uses that would be located in the eastern portion of the site. Therefore, development and operation of the proposed project would not expose persons to residual hazardous materials from past uses of the Villa Park Landfill. Impacts would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

Implement Mitigation Measure HAZ-2a.

**Level of Significance After Mitigation**

Less than significant impact.

**Emergency Response and Evacuation**

<table>
<thead>
<tr>
<th>Impact HAZ-5</th>
<th>The project may impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.</th>
</tr>
</thead>
</table>

**Impact Analysis**

The proposed project would take vehicular access from E. Santiago Canyon Road via a full-access signalized driveway aligned with Nicky Way. The Fire Department noted that the project would be required to provide two points of emergency access in accordance with Fire Code requirements. Mitigation Measure HAZ-5 requires the applicant to demonstrate compliance with all Fire Code emergency access requirements prior to issuance of building permits.

Additionally, the proposed project would not modify any surrounding roadways in a manner that could impair emergency response or evacuation (road closures, lane narrowing, etc.). Thus, the proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, impacts would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM HAZ-5**

Prior to issuance of the first building permit, the applicant shall prepare and submit plans to the City of Orange for review and approval demonstrating compliance with all applicable emergency access provisions of the Fire Code. The approved plan shall be incorporated into the proposed project.
Level of Significance After Mitigation
Less than significant impact.

Wildland Fires

Impact HAZ-6: The project may expose persons or property to wildland fire hazards.

Impact Analysis
The eastern portion of the project site abuts Santiago Oak Regional Park and contains the wooded Santiago Creek Corridor. The Orange Fire Department noted that the project site is located at the wildland/urban interface and indicated that the project would be subject to the City's fuel modification requirements. The project proposes to strategically place approximately 69 acres of open space/grasslands and greenway with managed vegetation within the western, northern, and eastern portions of the project site, to provide sufficient protection from wildland fires, and alleviate related impacts. However, Mitigation Measure HAZ-6 will be applied to require the applicant to prepare a Fuel Modification Plan and submit it to the City of Orange for review and approval prior to issuance of building permits, consistent with the Fire Departments recommendation.

Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
MM HAZ-6 Prior to issuance of the first building permit, the applicant shall retain a qualified fire safety consultant to prepare a Fuel Modification Plan for the proposed project. The plan shall identify defensible space around dwelling units in accordance with City requirements. The plan shall be submitted to the City of Orange for review and approval. The approved plan shall be incorporated into the proposed project.

Level of Significance After Mitigation
Less than significant impact.
3.9 - Hydrology and Water Quality

3.9.1 - Introduction

This section describes the existing hydrology and water quality setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on the Preliminary Hydrology and Hydraulic Report prepared by Fuscoe Engineering, which is provided as Appendix G.

3.9.2 - Environmental Setting

Climate and Meteorology

The coastal plain of Orange County is characterized by a Mediterranean climate, with mild winters and warm summers. Temperatures range from an average low of 46.9 degrees Fahrenheit (°F) in December to an average high of 87.1°F in August. Average rainfall is 14.09 inches. Table 3.9-1 summarizes local meteorology, as measured in Anaheim, California (approximately 4.35 miles south of the project site).

Table 3.9-1: Orange Meteorological Summary

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Temperature (°F)</th>
<th>Precipitation (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>January</td>
<td>47.5</td>
<td>70.0</td>
</tr>
<tr>
<td>February</td>
<td>48.2</td>
<td>70.0</td>
</tr>
<tr>
<td>March</td>
<td>50.4</td>
<td>72.4</td>
</tr>
<tr>
<td>April</td>
<td>52.8</td>
<td>74.7</td>
</tr>
<tr>
<td>May</td>
<td>57.3</td>
<td>77.1</td>
</tr>
<tr>
<td>June</td>
<td>60.5</td>
<td>80.1</td>
</tr>
<tr>
<td>July</td>
<td>64.2</td>
<td>85.2</td>
</tr>
<tr>
<td>August</td>
<td>64.5</td>
<td>87.1</td>
</tr>
<tr>
<td>September</td>
<td>62.7</td>
<td>86.5</td>
</tr>
<tr>
<td>October</td>
<td>57.7</td>
<td>81.2</td>
</tr>
<tr>
<td>November</td>
<td>51.8</td>
<td>75.4</td>
</tr>
<tr>
<td>December</td>
<td>46.9</td>
<td>69.7</td>
</tr>
<tr>
<td><strong>Annual Average</strong></td>
<td><strong>55.4</strong></td>
<td><strong>77.4</strong></td>
</tr>
</tbody>
</table>

Note:
Measurements taken at the Anaheim weather station between August 1, 1989 and June 9, 2016.
Source: Western Regional Climate Center, 2016.

Surface Water Bodies

The project site is located within the Santiago Creek watershed, which is tributary to the Santa Ana River. Both watersheds are discussed separately.
Santiago Creek
The Santiago Creek watershed is approximately 110 square miles and encompasses portions of the cities of Anaheim, Orange, Santa Ana, and Villa Park, as well as the northern Santa Ana Mountains in unincorporated Orange County. The creek originates on the slopes of Santiago Peak and Modjeska Peak in the Santa Ana Mountains, and meanders approximately 29 miles to its confluence with the Santa Ana River. The Santiago Creek watershed is depicted in Exhibit 3.9-1.

The creek is impounded at Irvine Lake by Santiago Dam, constructed in 1931. Most of the creek’s flows are diverted at Irvine Lake for potable use by the Serrano Water District and non-potable use by the Irvine Ranch Water District. Downstream of Santiago Dam, the creek is usually dry outside of the wet season.

Approximately 3.5 miles downstream of Santiago Dam, the creek is impounded again at the Villa Park Reservoir by the Villa Park Dam, constructed in 1963. The Villa Park Reservoir is a flood control facility and does not store water for potable or non-potable use. Between Villa Park Dam and the Santiago Creek Recharge Basin, the waterway is contained in a natural channel. From the recharge basin to the Santa Ana River, the creek is mostly contained in a concrete-lined channel.

Santa Ana River
The Santa Ana River watershed is approximately 2,650 square miles and encompasses portions of Los Angeles, Riverside, San Bernardino, and Orange counties. The river originates in the San Bernardino Mountains and discharges into the Pacific Ocean at Huntington Beach, a distance of 96 miles. Major tributaries include Bear Creek (which originates at Big Bear Lake), City Creek, Lytle Creek, Cucamonga/Mill Creek, Temescal Creek, Chino Creek, and Santiago Creek. More than 4.5 million people reside within the watershed.

According to the Santa Ana River Basin Plan, the river slows as it reaches the City of Anaheim, where Orange County Water District (OCWD) diverts and recharges essentially all the dry weather flows. Outside the wet season, the Santa Ana River is dry downstream of Anaheim. The Santa Ana River watershed is depicted in Exhibit 3.9-2.

Surface Water Quality
Santiago Creek and the Santa Ana River are listed as impaired water bodies on the currently adopted Regional Board’s 303(d) list. Table 3.9-2 summarizes the characteristics of the impaired water bodies. The proposed 2016 303(d) List proposes to add Benthic Community Effects and Toxicity to Santiago Creek Reach 4 and delist indicator bacteria from the Santa Ana River Reach 2.

Table 3.9-2: Impaired Water Body Summary

<table>
<thead>
<tr>
<th>Waterway</th>
<th>Reach</th>
<th>Stressors</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Santiago Creek</td>
<td>Reach 4: Santa Ana Mountains</td>
<td>Salinity/Total Dissolved Solids/Chlorides</td>
<td>Unknown</td>
</tr>
<tr>
<td>Santa Ana River</td>
<td>Reach 2: Prado Dam to 17th Street (Santa Ana)</td>
<td>Indicator Bacteria</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

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Santiago Creek Water Quality Monitoring

As part of the County-wide stormwater program, surface water monitoring is conducted along Santiago Creek. Currently, there are no monitoring locations for Santiago Creek Reach 1 within the proximity of the proposed project site. However, sampling in the project vicinity has been performed in the past. Field screening data and channel monitoring data were collected at two monitoring stations; one upstream and one downstream of the project site, during the periods of 1967 to 1994, and 1992 to 1996 respectively. The County’s field screening program includes on-site physical and chemical evaluations including dry weather and storm event sampling, as part of an effort to detect illicit connections and illegal discharges. The channel monitoring was conducted using automated samplers, and typically on a monthly basis. A summary of the selected data is provided in Table 3.9-3 and Table 3.9-4.

Table 3.9-3: Santiago Creek Field Screening Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Santiago Creek/Bristol Street (Downstream)</th>
<th>Villa Park Dam (Upstream)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow (cfs)</td>
<td>5.3 200 2 100 5.3</td>
<td>—  — 700</td>
</tr>
<tr>
<td>pH</td>
<td>7.8 7.9 8.5 9.1 7.6</td>
<td>7.2 7.3 8.1</td>
</tr>
<tr>
<td>Conductivity (µmhos)</td>
<td>327 182 912 145 158</td>
<td>863 598 710</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>17.4 13.8 22 17.8 16.1</td>
<td>16.3 22 15.5</td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/l)</td>
<td>10.5 7.8 8.6 17.9 7.8</td>
<td>5.1 1.4 12.2</td>
</tr>
</tbody>
</table>

Notes:
cfs = cubic feet per second  µmhos = micromhos  °C = degrees Celsius  mg/l = milligrams per liter


Table 3.9-4: Santiago Creek Channel Monitoring Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sampling Period</th>
<th>Santiago Canyon Road Bridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature (°C)</td>
<td>1977–1994</td>
<td>22</td>
</tr>
<tr>
<td>Flow (cfs)</td>
<td>1964–1994</td>
<td>1,500</td>
</tr>
<tr>
<td>Conductivity (µmhos)</td>
<td>1978–1994</td>
<td>912</td>
</tr>
<tr>
<td>Dissolved Oxygen (mg/l)</td>
<td>1978–1994</td>
<td>17.9</td>
</tr>
<tr>
<td>pH</td>
<td>1978–1994</td>
<td>9.1</td>
</tr>
<tr>
<td>Oil and Grease (mg/l)</td>
<td>1978–1980</td>
<td>18.8</td>
</tr>
<tr>
<td>Total Dissolved Solids (mg/l)</td>
<td>1967–1974</td>
<td>368</td>
</tr>
</tbody>
</table>
Table 3.9-4 (cont.): Santiago Creek Channel Monitoring Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Sampling Period</th>
<th>Santiago Canyon Road Bridge</th>
<th>Basin Plan Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrate (mg/l)</td>
<td>1967–1980</td>
<td>26.4</td>
<td>0</td>
</tr>
<tr>
<td>Dissolved Boron (mg/l)</td>
<td>1967–1974</td>
<td>200</td>
<td>16</td>
</tr>
<tr>
<td>Dissolved Fluoride (mg/l)</td>
<td>1967–1974</td>
<td>0.3</td>
<td>0.2</td>
</tr>
<tr>
<td>Total Coliform (MPN/100ml)</td>
<td>1978–1980</td>
<td>240,000</td>
<td>90</td>
</tr>
</tbody>
</table>

Notes:
csf = cubic feet per second µhos = micromhos °C = degrees Celsius mg/l = milligrams per liter

Drainage

In the project vicinity, stormwater runoff is collected and disposed of through an integrated system of curbside gutters, catch basins, drainage ditches, man-made channels, and creeks. The City of Orange and Orange County Flood Control District oversee and manage municipal storm drainage facilities within the City of Orange. Drainage characteristics of the project site are summarized below.

Project Site

The project site does not have any storm drainage facilities. Runoff generally ponds on-site, sheet flows to Santiago Creek, or sheet flows off-site into inlets along adjoining roadways. The latter flows are eventually discharged into the waterway via the municipal storm drainage system. The existing drainage patterns are shown in Exhibit 3.9-3.

Handy Creek Storm Drain

The Handy Creek storm drain operated by the Orange County Flood Control District is located underground in the central portion of the project site. The storm drain enters the project site from the south at the intersection of N. Nicky Way/E. Santiago Canyon Road. The storm drain conveys stormwater collected in areas south of E. Santiago Canyon Road into Santiago Creek.

Within the project site, the storm drain consists of a double 12-foot by 9-foot reinforced concrete box structure. Runoff from the project site enters the Handy Creek storm drain through several on-site sump inlets. In 2011, the County of Orange advised that the Handy Creek storm drain was a deficient flood control facility and not capable of conveying runoff from a 100-year storm event.

Unnamed Storm Drain

Two unnamed storm drains are located in the northwestern portion of the project site and convey stormwater collected in the Mabury Ranch neighborhood directly into Santiago Creek. Note that the project site does not directly discharge runoff into either storm drain.
Exhibit 3.9-3
Existing Drainage Patterns

Source: Fuscoe Engineering,
Groundwater

The City of Orange overlies the Orange County (OC) Groundwater Basin. The OC Basin underlies the northerly half of Orange County beneath broad lowlands. The OC Basin is managed by OCWD and covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the northeast, and the Pacific Ocean to the southwest. The OC Basin boundary extends to the Orange County-Los Angeles Line to the northwest, where groundwater flows across the county line into the Central Groundwater Basin of Los Angeles County. The total thickness of sedimentary rocks in the OC Basin is over 20,000 feet, with only the upper 2,000 to 4,000 feet containing fresh water. The Pleistocene or younger aquifers that make up this Basin are over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits. The OC Basin’s full volume is approximately 66 million acre-feet.

Groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the OC Basin and to protect against land subsidence. OCWD regulates groundwater levels in the OC Basin by regulating the annual amount of pumping.

The OC Basin is not adjudicated; as such, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. The framework for the financial incentives is based on establishing the basin production percentage, the percentage of each Producer’s total water supply that comes from groundwater pumped from the OC Basin. Groundwater production at or below the basin production percentage is assessed a Replenishment Assessment. While there is no legal limit as to how much an agency pumps from the OC Basin, there is a financial disincentive to pump above the basin production percentage. Agencies that pump above the basin production percentage are charged the Replenishment Assessment plus the Basin Equity Assessment, which is calculated so that the cost of groundwater production is greater than Municipal Water District of Orange County’s full service rate. The Basin Equity Assessment can be increased to discourage production above the basin production percentage. The basin production percentage is set uniformly for all producers by OCWD on an annual basis.

Flood Hazard Areas

The National Flood Insurance Act (1968) established the National Flood Insurance Program (NFIP), which provides for the minimal requirements for floodplain management and is designed to minimize flood drainage within Special Flood Hazard Areas. The Federal Emergency Management Agency (FEMA) is the agency that administers the National Flood Insurance Program. The Special Flood Hazard Area is the area subject to flooding by the 1 percent annual chance flood. The 1 percent annual flood (100-year flood), also known as the base flood, is the flood that has a 1 percent chance of being equaled or exceeded in any given year. Areas of Special Flood Hazard include Zones: A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation (BFE) is the water-surface elevation of the 1 percent annual chance flood. Flood Insurance Rate Maps (FIRMs) were developed by the NFIP to identify areas of flood hazards within a community.

Exhibit 3.9-1 depicts the Federal Emergency Management Agency’s floodplain mapping for the project vicinity. As shown in Exhibit 3.9-4, the project site contains 100-year and 500-year flood
hazard areas. The 100-year flood hazard areas within the project site overlap with the Santiago Creek channel. The 500-year flood hazard areas overlap with areas south of the creek, including areas that were previously mined.

**Santiago Dam**

Santiago Dam is located 5.0 miles upstream of the project site and, along with Irvine Lake, is jointly owned and operated by the Serrano Water District and Irvine Ranch Water District. The dam was completed in 1931 and impounds Irvine Lake. Santiago Dam is an earth/rock-fill structure that is 136 feet tall and 1,425 feet long. The dam is designed to contain up to a 50-year flood and withstand a 500-year flood of over 30,000 cubic feet per second.

**Villa Park Dam**

Villa Park Dam is located approximately 1.5 miles upstream of the project site and is owned and operated by the Orange County Flood Control District. The dam was completed in 1963 and is used for flood control purposes; it does not store water for municipal use. Villa Park Dam is an earth/rock-fill structure that has a capacity of 15,600 acre-feet.

**3.9.3 - Regulatory Framework**

**Federal**

**Clean Water Act**

Section 303 of the 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 (see description the Porter-Cologne Water Quality Control Act, 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 401 of the CWA requires any person applying for a federal permit or license that may result in the discharge of pollutants into waters of the United States (including wetlands) to obtain a state certification. In California, certifications are administered by the State Water Resources Control Board (SWRCB) through the nine RWQCBs (see a description of state regulations below). In order to acquire certification, it must be demonstrated that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit by a federal agency may be granted until 401 certification has been granted. Section 401 water quality certifications are typically required prior to obtaining a Section 404 permit from the United States Army Corps of Engineers (USACE).

Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of National Pollutant Discharge Elimination System (NPDES) stormwater program. In California, any construction activity (with the exception of certain industrial activities, none of which are proposed for this project) that disturbs at least one acre is covered under the Construction General Permit issued by the SWRCB and implemented and enforced by RWQCBs.
Exhibit 3.9-4

100-Year Flood Hazard Areas

Legend

- Project Site
- Special Flood Hazard Areas
  - Zone AE - Within 0.1% chance annual flood, base flood elevations determined
  - Zone AE - Within 0.1% chance annual flood. Within floodway.
- Other Flood Hazard Areas
  - Zone X - Areas of 0.2% chance annual flood
- Other Areas
  - Zone X - Areas outside the 0.2% annual chance floodplain.

Source: California Department of Conservation, 2014
Floodplains
FEMA oversees floodplains and administers the National Flood Insurance Program (NFIP) adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities who participate in the program. Areas of special flood hazard (those subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The NFIP mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in more than 1 foot increase in flood elevation. In addition, development is not allowed in delineated floodways within the regulatory floodplain.

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding a project in a floodplain to do the following:

- Avoid incompatible floodplain development,
- Be consistent with the standards and criteria of the NFIP, and
- Restore and preserve natural and beneficial floodplain values.

Executive Order 11990 requires federal agencies to follow avoidance, mitigation, and preservation procedures, with public input, before proposing new construction in wetlands. It generally requires:

- Avoidance of wetlands,
- Minimization of activities in wetlands, and
- Coordination with the USACE and CWA Section 404 regarding wetlands mitigation.

State
Water Quality Statutes and Regulations
Section 303(d) of the CWA requires that 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” for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the United States Environmental Protection Agency (EPA) in 2010.

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 requirements of Clean Water Act Section 303, indicating that water quality standards have to be set for certain waters by adopting water quality control plans under the Porter-Cologne Act. The Porter-Cologne Act established the responsibilities and authorities 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. 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. The RWQCB for the project site is the Santa Ana River Region.

Post-construction stormwater controls to satisfy requirements of the NPDES Program are permitted under the Phase II Small Municipal Separate Storm Sewer System (MS4) Permit (Order No. 2013-0001 DWQ, effective July 1, 2013).

Projects disturbing more than one acre of land during construction are required to comply with the Construction General Permit (Order No. 2009-0009-DWQ as amended by 2010-0014-DWQ, effective February 14, 2011; NPDES No. CAS000002). 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 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 applicant when the Notice of Intent is filed (and when 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.

Local

City of Orange

General Plan

The City of Orange General Plan sets forth the following goals and policies relevant to hydrology and water quality:

Natural Resources Element
- **Goal 2.0:** Protect air, water, and energy resources from pollution and overuse.
- **Policy 2.4:** Encourage the production, distribution, and use of recycled and reclaimed water for landscaping projects, while maintaining urban runoff water quality objectives.
• **Policy 2.12:** Cooperate with water supply agencies to protect the quantity and quality of local groundwater supplies.

• **Policy 2.13:** Control surface runoff water discharges into the stormwater conveyance system to comply with the City’s National Pollutant Discharge Elimination System (NPDES) Municipal Permit and other regional permits issued by the Santa Ana Regional Water Quality Control Board.

• **Policy 2.14:** Reduce pollutant runoff from new development by requiring use of the most low development impact practices and effective Best Management Practices (BMPs) currently available.

• **Policy 2.15:** Minimize the amount of impervious surfaces and associated urban runoff pollutants in new development and significant redevelopment throughout the community.

• **Policy 2.16:** Protect in-stream habitat and natural stream and channel features.

**Infrastructure Element**

• **Goal 1.0:** Ensure water, sewer, and storm drain systems that meet the needs of residents and businesses.

• **Policy 1.1:** Provide sufficient levels of water, sewer, and storm drain service throughout the community.

• **Policy 1.2:** Correct known deficiencies in the City’s sewer, storm drain, and water systems and work toward environmentally sustainable systems.

• **Policy 1.6:** Require that new developments fund fair-share costs associated with City provision of water, sewer, and storm drain service and are consistent with City and service provider plans to complete needed improvements and funding capacity for such improvements.

**Drainage Area Management Plan**

The Drainage Area Management Plan (DAMP) is Orange County’s principal policy and guidance document for the NPDES program. The plan has been in effect since 1993, with subsequent updated elements. A revised DAMP was submitted to the Santa Ana Regional Water Quality Control Board in July 2006, known as the 2007 DAMP. In May 2009, the Santa Ana RWQCB re-issued the MS4 Permit for the Santa Ana Region of Orange County (fourth term permit), which will result in future changes to the Drainage Area Management Plan and City of Orange Local Implementation Plan and stormwater program. In addition to the previous requirements under the third term permit, the requirements of the new 4th term permit include requirements pertaining to hydromodification and low impact development features associated with new developments and redevelopments.

**3.9.4 - Methodology**

FirstCarbon Solutions obtained information from the Hydrologic Assessment Report and the Water Quality Technical Report, both prepared by Fuscoe Engineering, Inc. The Fuscoe reports are provided in Appendix G.

Additional information was provided by the City of Orange General Plan, City of Orange General Plan EIR, the City of Orange 2015 Urban Water Management Plan, and the Orange County Sheriff’s Department Orange County Operational Area Emergency Action Plan Dam/Reservoir Failure Annex.
3.9.5 - 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? (Refer to Section 7, Effects Found Not To Be Significant.)

3.9.6 - 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: | Construction and operational activities associated with the proposed project may potentially degrade water quality in downstream water bodies. |

Impact Analysis

This impact addresses whether the proposed project would violate any water quality standards or waste discharge requirements (Checklist Item a); 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 (Checklist Item c); or otherwise substantially degrade water quality (Checklist Item f) during construction activities.

**Short-Term Water Quality**

Project implementation would require grading, building construction, and paving activities on the 40.2 acres proposed for residential development and portions of the remaining 69 acres proposed for open space and recreation. During construction activities, there would be the potential for surface water to carry sediment from on-site erosion and other pollutants into the stormwater system and local waterways.

Construction of the proposed project would also 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 would be utilized during construction. An accidental release of any of these substances could degrade the water quality of the surface water runoff and add additional sources of pollution into the drainage system.

NPDES stormwater permitting is required by the State Water Board’s Construction General Stormwater Permit (General Permit). The General Permit regulates stormwater discharges from construction sites. Under the General Permit, the preparation and implementation of SWPPPs are required for construction activities more than 1 acre in area. The SWPPP must identify potential sources of pollution that may be reasonably expected to affect the quality of stormwater discharges as well as identify and implement BMPs that ensure the reduction of these pollutants during stormwater discharges.

Mitigation Measure HYD-1a is proposed, which would require the project applicant to prepare and implement a SWPPP. The implementation of this mitigation measure would ensure that potential, short-term, construction water quality impacts are reduced to a level of less than significant.

**Long-Term Water Quality**

The project site contains mostly pervious surfaces. Runoff either sheet flows into Santiago Creek or sheet flows into inlets along onto adjoining roadways, where it enters the creek via the municipal storm drainage system.

The proposed project would result in the removal of the existing improvements, the grading of the site, and the development of up to 129 dwelling units and associated infrastructure and open space and recreation facilities. The proposed project would increase the amount of impervious surface coverage on the project site and would create the potential for discharge of urban pollutants into downstream waterways. Such pollutants would include sediment and turbidity, nutrients, organic compounds, oxygen demanding substances, trash and debris, bacteria and viruses, oil and grease, pesticides, and metals.

To ensure that stormwater quality measures are implemented, Mitigation Measure HYD-1b is proposed, which would require the project applicant to prepare and submit a Water Quality
Management Plan to the City of Orange for review and approval. Typical elements within a stormwater management plan include identifying pollution prevention measures and practices that comply with the most recently adopted provisions of the Municipal Regional Permit. The implementation of this mitigation measure would ensure that potential, long-term, operational water quality impacts are reduced to a level of less than significant.

Level of Significance Before Mitigation
Potentially significant impact.

Mitigation Measures

**MM HYD-1a**  
Prior to the issuance of grading permits, the project applicant shall file a Notice of Intent with and obtain a facility identification number from the State Water Resources Control Board. The project applicant shall also submit a Stormwater Pollution Prevention Plan (SWPPP) to the City of Orange that identifies specific actions and Best Management Practices (BMPs) to prevent stormwater pollution during construction activities. The City of Orange shall review and approve the SWPPP. The SWPPP shall identify a practical sequence for BMP implementation, site restoration, contingency measures, responsible parties, and agency contacts. The SWPPP shall include but not be limited to the following elements:

- Comply with the requirements of the State of California’s most current Construction Stormwater Permit.
- Temporary erosion control measures shall be implemented on all disturbed areas.
- Disturbed surfaces shall be treated with erosion control measures during the October 15 to April 15 rainy season.
- Sediment shall be retained on-site by a system of sediment basins, traps, or other BMPs.
- The construction contractor shall prepare Standard Operating Procedures for the handling of hazardous materials on the construction site to eliminate discharge of materials to storm drains.
- BMP performance and effectiveness shall be determined either by visual means where applicable (e.g., observation of above-normal sediment release), or by actual water sampling in cases where verification of contaminant reduction or elimination (such as inadvertent petroleum release) is required by the Santa Ana Regional Water Quality Control Board to determine adequacy of the measure.
- In the event of significant construction delays or delays in final landscape installation, native grasses or other appropriate vegetative cover shall be established on the construction site as soon as possible after disturbance, as an interim erosion control measure throughout the wet season.

**MM HYD-1b**  
Prior to the issuance of building permits, the project applicant shall submit a Water Quality Management Plan to the City of Orange for review and approval. The plan shall be developed using the California Stormwater Quality Association’s “New Development and Redevelopment Handbook.” The Water Quality Management
Plan shall identify pollution prevention measures and Best Management Practices necessary to control stormwater pollution from operational activities and facilities, and provide for appropriate maintenance over time. The Water Quality Management Plan shall include design concepts that are intended to accomplish a “first flush” objective that would remove contaminants from the first 2 inches of stormwater before it enters area waterways. The project applicant shall also prepare and submit an Operations and Maintenance Agreement to the City identifying procedures to ensure that stormwater quality control measures work properly during operations.

**Level of Significance After Mitigation**

Less than significant impact.

**Groundwater**

| Impact HYD-2: | The proposed project would not contribute to groundwater overdraft or impair groundwater recharge. |

**Impact Analysis**

This impact assesses whether project would substantially deplete groundwater supplies or interfere substantially with groundwater recharge, and the related issue of groundwater impairment from underground storage tanks.

**Groundwater Supplies**

The proposed project would result in a net increase in demand for potable water from the City of Orange. The proposed project is anticipated to demand 116 acre-feet of water annually; refer to Section 3.17, Utilities and Service Systems for further detail regarding the demand estimate. The City’s 2015 Urban Water Management Plan indicates that groundwater constitutes approximately 72 percent of the City’s potable water supply. The 2015 Urban Water Management Plan contemplates up to 20,650 acre-feet of groundwater production from the OC Basin annually through 2040. Thus, the proposed project’s demand would be equivalent to 0.5 percent of the total volume of city groundwater production contemplated by the 2015 Urban Water Management Plan. Moreover, the proposed project’s demand is accounted for by the 2015 Urban Water Management Plan and, thus, reflected in the demand estimates.

The OC Basin is managed by OCWD, which assess fees to agencies that pump from the basin. The fees are structured in a manner that penalizes pumping above the basin production percentage threshold. Once the threshold is exceeded, additional fees are assessed that make the per unit cost of groundwater production costlier than other sources of water (i.e., imported water). The OC Basin is not classified as being in a state of overdraft by the California Department of Water Resources, which serves as evidence that OCWD’s management efforts have been successful in preserving the sustainability of the resource.
Because project demand would represent a very small percent of total groundwater supply and due to the success of OCWD’s groundwater management efforts, impacts on groundwater resources would be considered less than significant.

**Groundwater Recharge**

The project site is bisected by Santiago Creek, which provides for groundwater recharge within its channels. The proposed project would develop residential uses on 40.2 acres of the project site, with open space and recreation uses on the remaining 59 acres. The entire Santiago Creek corridor would be protected as a greenway and, thus, would be available for continued groundwater recharge. Therefore, the proposed project would not interfere with groundwater recharge efforts. 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.

**Drainage**

**Impact HYD-3:** The proposed project would not contribute runoff to downstream storm drainage facilities that would result in the potential for flooding.

**Impact Analysis**

The proposed project would result in the development of up to 129 dwelling units and infrastructure on 40.2 acres of the project site. The remaining acreage would be dedicated for open space and recreation use. Thus, the proposed project would increase the amount of impervious surface coverage on the project site, and would create the potential for increased runoff leaving the project site that may create potential flooding conditions in downstream waterways.

Of particular concern is the Handy Creek storm drain, which currently accepts runoff from the project site under existing conditions. The County of Orange has previously identified the storm drain as a deficient flood control facility that is not capable of conveying runoff from a 100-year storm event.

The proposed project would install a network of storm drainage facilities within the project site consisting of inlets, underground piping, and basins. This system would serve 72.58 acres of the site and direct runoff to a 3.7-acre foot capacity stormwater detention basin in the western portion of the site. A flow control structure will be installed within the detention system to meter the outflow from the site to below predevelopment levels. Catch basins will be located at various points within the site to capture subarea flows. The system is designed to detain flows from a 100-year storm event as required by the Orange County Hydrology Manual.
Two sub drainage areas will flow directly to Santiago Creek without detention. One of these areas is approximately 1.46 acres directly over the Handy Creek Channel. This flow will be directed to the Handy Creek Channel. The other area is the trail system adjacent to Santiago Creek and totals 6.20 acres. This flow will be picked up via a storm drain system, which will outlet at the same location as the detention basin outlet. The outlet structure from the detention basin to Santiago Creek will be protected by riprap and an energy dissipater.

Table 3.9-5 summarizes existing and proposed discharge rates into Santiago Creek from the main drainage area for the 2-year and 100-year storm events. As shown in the table, the project would achieve a net reduction of stormwater discharge during storm events.

### Table 3.9-5: Existing and Proposed Discharge Rates—Proposed Storm Drainage System

| Storm Event | Drainage Area | Cubic Feet/Second | Difference | Change  
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
<td></td>
</tr>
<tr>
<td>2-Year</td>
<td>72.58 acres</td>
<td>44.46</td>
<td>28.72</td>
<td>-15.74</td>
</tr>
<tr>
<td>100-Year</td>
<td></td>
<td>180.05</td>
<td>82.72</td>
<td>-97.33</td>
</tr>
</tbody>
</table>


Table 3.9-6 summarizes existing and proposed discharge rates into the Handy Creek storm drain for the 2-year and 100-year storm events. As shown in the table, the project would achieve a no net increase discharge of stormwater into the Handy Creek storm drain during storm events.

### Table 3.9-6: Existing and Proposed Discharge Rates—Handy Creek Storm Drainage

| Storm Event | Drainage Area | Cubic Feet/Second | Difference | Change  
<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Existing</td>
<td>Proposed</td>
<td></td>
</tr>
<tr>
<td>2-Year</td>
<td>1.46 acres</td>
<td>1.41</td>
<td>1.41</td>
<td>—</td>
</tr>
<tr>
<td>100-Year</td>
<td></td>
<td>4.43</td>
<td>4.43</td>
<td>—</td>
</tr>
</tbody>
</table>


This serves to illustrate that the proposed storm drainage system would slow, reduce, and meter the volume of runoff leaving the project site and ensure that downstream storm drainage facilities are not inundated with project-related stormwater. Impacts would be less than significant.

Finally, the proposed project would not alter the two unnamed storm drains located in the northwestern portion of the project site.

**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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### 100-Year Flood Hazard Areas

**Impact HYD-4:** The proposed project would not place housing or structures within a 100-year flood hazard area.

**Impact Analysis**

As shown in Exhibit 3.9-1, the 100-year flood hazard areas within the project site overlap with the Santiago Creek channel. The proposed project would establish a greenway along the creek corridor and, thus, would not alter the existing 100-year flood hazard areas. Furthermore, the proposed residential uses would be located outside of the 100-year flood hazard areas.

The areas mapped as 500-year flood hazard areas mostly coincide with areas proposed for open space and recreation, although approximately 15 acres of the residential area overlaps with this area. However, current federal regulations only require that “critical facilities” be located above the 500-year flood elevation; residential uses are permitted within this 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.

---

### Levee or Dam Failure

**Impact HYD-5:** The project may be susceptible to inundation from dam failure.

**Impact Analysis**

Santiago Dam is located 1.3 miles upstream of the project site. The dam was completed in 1931 and impounds Irvine Lake. Santiago Dam is an earth/rock-fill structure that is 136 feet tall and 1,425 feet long. The dam designed to contain up to a 50-year flood and withstand a 500-year flood of over 30,000 cubic feet per second.

Villa Park Dam is located approximately 1.5 miles upstream of the project site and is owned and operated by the Orange County Flood Control District. The dam was completed in 1963 and is used for flood control purposes; it does not store water for municipal use. Villa Park Dam is an earth/rock-fill structure that has a capacity of 15,600 acre-feet.
The California Department of Water Resources Division of Safety of Dams oversees dam safety and requires local dam operators to maintain records concerning maintenance, operation, staffing, and engineering and geologic investigations that pertain to their facilities. Division of Safety of Dams personnel have the ability inspect dams for safety and require operators to implement corrective measures if deficiencies are found. Additionally, the Division of Safety of Dams oversees alteration and repair of dams. The agencies that own and operate Santiago Dam and Villa Park Dam are responsible for compliance with State laws that pertain to the safety of the facilities.

Additionally, at least one staff person from the Orange County Flood Control District is stationed at each facility 24 hours a day, 7 days a week to monitor dam and reservoir conditions. Staff members are trained in the operation of the facilities and would be able to identify and respond to indications of adverse conditions; initial alerting of a dam failure would come from these dam keepers. Furthermore, the Orange County Sheriff’s Department oversees the County’s Emergency Operations Center and has modeled dam failure scenarios for both Villa Park Dam and Santiago Dam based on FEMA Flood Maps (Exhibit 3.9-4). The Sheriff’s Department has developed plans to provide timely notification to affected parties and implement an orderly evacuation in the event dam failure indications are observed, such as the AlertOC mass notification system that provides time-sensitive messages to residents from the City of County in which they live or work. The Orange County Operational Area Emergency Action Plan Dams/Reservoir Failure Annex indicates that it would take a dam failure flood wave 105 minutes to reach the project site from Villa Park Dam and 255 minutes from Santiago Dam. Emergency response times vary on average from 4 to 7 minutes for the City of Orange Police Department and 3 minutes, 45 seconds for the City of Orange Fire Department. Further discussion on the City of Orange Police and Fire Departments can be found in Section 3.14, Public Services of this Draft EIR.

In the interests of promoting awareness about the potential for dam failure and making future residents aware of evacuation procedures, Mitigation Measure HYD-5 requires the applicant to prepare and implement an emergency evacuation plan. With the implementation of mitigation, impacts would be less than significant.

**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**

**MM HYD-5** Prior to issuance of the first certificate of occupancy, the applicant shall retain a qualified consultant to prepare and implement an Emergency Evacuation Plan. The plan shall identify the various types of emergency that could affect the proposed project (e.g., dam failure, earthquake, flooding, etc.) and identify procedures for the safe and orderly evacuation of the project. The plan shall require that streets be identified with clear and visible signage and, if necessary, wayfinding signage be provided to identify exit points.

**Level of Significance After Mitigation**
Less than significant impact.
3.10 - Land Use and Planning

3.10.1 - Introduction

This section describes the existing land use and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on-site reconnaissance, and review of the City of Orange General Plan, the Orange Municipal Code, the East Orange Plan, and the Orange Park Acres Plan.

3.10.2 - Environmental Setting

Land Use

Project Site

The approximately 109-acre project site contains disturbed, privately owned undeveloped land that previously supported mining activities and currently supports a sand gravel operator in accordance with the existing Sand and Gravel zoning (Orange Municipal Code Chapter 17.32). The project site is comprised of 12 parcels and is bisected by Santiago Creek in an east-west direction. The site contains gently sloping terrain, with an overall change in elevation from 456 feet above mean sea level in the northeast corner to 344 feet above mean sea level in the southwest corner. An approximately 10-acre, semi-oval-shaped raised pad is located in the eastern portion of the site. The pad sits roughly 15 feet higher than the mining area to the west.

Approximately 40 acres between Santiago Creek and E. Santiago Canyon Road contains remnants of the mining operation and is the location of the ongoing sand and gravel operation. This area is characterized by soil piles, berms, and unpaved roads. Adjacent to E. Santiago Canyon Road is an approximately 5-acre area that supports a materials recycling operation that included apparatus for the crushing of boulders, bricks, rocks, and similar materials for recycling. Materials used for these operations originated primarily from off-site sources, and the materials generated by these operations have historically been used both on-site and transported off-site. Ancillary uses include administration and maintenance buildings, caretaker residence, material testing laboratory, driver’s shack, rock crushing facilities, several aboveground and belowground fuel storage tanks and two hot-mix asphalt plants.

Additionally, the previously mined portions of the site were “backfilled,” in which unsuitable materials are excavated and replaced with fill, pursuant to a grading permit issued by the City of Orange in 2011. It was anticipated that approximately 223,000 cubic yards of material would be imported to the site during the process, including concrete, asphalt, and rock that would be crushed on-site. Approximately 2,000 cubic yards of material was anticipated to be excavated from the site for reuse and would be blended with the crushed import material for a total of 225,000 cubic yards of backfill. In 2015, in a “good faith” gesture, the operator voluntarily temporarily suspended operations on the site, and limited rock crushing operations to a total of 15 consecutive business days in any 6-month period. The operator reserved the right to resume all operations consistent with the Sand and Gravel zoning.
Santiago Creek enters the site at the eastern boundary, flows west, and exits the western boundary at N. Cannon Street. The creek originates at Irvine Lake and is tributary to the Santa Ana River. The drainage feature splits near the central portion of the project site, with an upland area separating Santiago Creek into two rivulets. The average width of the drainage feature is approximately 55 feet, which includes the area between the ordinary high water mark and the adjacent defined wetland areas. Wetland areas are generally located on either side of the active channel. The creek corridor is privately owned and is not accessible to the public.

Natural vegetation within the site is primarily located along Santiago Creek. Plant communities include coast live woodland, coastal sage scrub, eucalyptus woodland, non-native grassland, ornamental, southern cottonwood-willow riparian forest, and undifferentiated open woodland. There are 323 trees located with the project site, of which the most common species are blue gum (eucalyptus), oak, willow, and palm.

The Handy Creek storm drain operated by the Orange County Flood Control District (OCFCD) (Facility No. E08506) is located in the central portion of the project site. The storm drain enters the project site from the south at the intersection of N. Nicky Way/E. Santiago Canyon Road. The storm drain conveys stormwater collected in areas south of E. Santiago Canyon Road into Santiago Creek. An unnamed storm drain located in the northwestern portion of the project site conveys stormwater collected in the Mabury Ranch neighborhood directly into Santiago Creek.

The Allen McCulloch Pipeline trunk water distribution line operated by the Metropolitan Water District (MWD) traverses the easterly portion of the project site and is located entirely below grade. The pipeline traverses the site within a 50-foot-wide easement. The easement crosses through the site in a northwest-southeast direction, entering the site from the north at the intersection of Mabury Avenue/Yellowstone Boulevard and exiting at the single-family residential subdivision to the south. The pipe measures 109 inches in diameter and is part of the MWD transmission system that supplies potable water to southern Orange County.

There are historic ground water and methane monitoring wells associated with the closed adjoining Villa Park Landfill that are located on the western portion of the project site.

**Surrounding Area**

**West**

The closed Villa Park Landfill and N. Cannon Street form the western boundary of the project site. The 18-acre County Villa Park Landfill property occupies the northeast quadrant of the intersection of E. Santiago Canyon Road/N. Cannon Street and is owned by the County of Orange. The landfill operated from 1962 through 1966. The site is enclosed with a fence and contains groundwater monitoring wells and a landfill gas disposal system. Areas to the west also include detached, single-family dwelling units related to Creekside Ranch (typical lot size 9,200–12,000 square feet), The Colony-North (typical lot size 8,600–12,000 square feet), and west of Cannon Street (typical lot size 7,800–10,000 square feet). Furthermore, a memorandum prepared by the City dated May 9, 2017 outlines a proposal to develop a temporary shelter initiative to offer shelter, cot, and sanctuary facilities in a safe location to any homeless person who chooses accommodations from the outdoors. During the preparation of this Draft EIR, the proposal is still under consideration.
N. Cannon Street is a four-lane divided roadway and crosses Santiago Creek via a concrete bridge. A paved Class I bicycle/pedestrian path (Santiago Creek Bike Trail) is located along the west side of N. Cannon Street south of Santiago Creek. See Exhibit 2-5 in Section 2, Project Description of this Draft EIR for the locations of surrounding residential uses with typical lot sizes less than 10,000 square feet.

North
Single-family residential uses are located to the north of the project site, including Maybury Ranch (typical lot size 7,600–11,000 square feet), Hidden Creek (typical lot size 20,000–24,500 square feet), Serrano Heights (typical lot size 4,500–9,000 square feet), and Parkridge (typical lot size 8,000–12,000 square feet). Detached, single-family dwelling units are located along the north bank of Santiago Creek. Mabury Avenue is a two-lane undivided roadway. An unpaved trail (Santiago Creek Trail) is located along the north bank of the creek, parallel to Mabury Avenue.

East
Santiago Oaks Regional Park and detached, single-family residential uses associated with The Reserve (typical lot size 20,000–44,000 square feet) form the eastern boundary of the project site. The regional park contains the Santiago Creek corridor, which consists of the waterway and dense vegetation. Detached, single-family dwelling units are located east of the project site.

South
E. Santiago Canyon Road, a four-lane, divided roadway, forms the southern boundary of the project site. Detached single-family dwelling units associated with the Jamestown neighborhood (typical lot size 8,000–11,000 square feet), Orange Park Acres (typical lot size 50,000 to 1 acre plus square feet), Eichler Homes (typical lot size 7,600–12,000 square feet), and The Colony-South (typical lot size 7,000–10,000 square feet) are located south of the roadway. The Mara Brandman Arena is located at the intersection of E. Santiago Canyon Road and N. Nicky Way.

Land Use Designations

Project Site
The City of Orange General Plan designates portions of the project site “Low Density Residential,” “Resource Area,” and “Open Space.” The City of Orange Zoning Ordinance zones the project site “S-G (Sand and Gravel Extraction)” and “R-1-8 (Single-Family Residential 8,000 square-feet).”

Surrounding Land Uses
Table 3.10-1 summarizes surrounding City of Orange General Plan, City of Orange zoning, East Orange General Plan, and Orange Park Acres Plan land use designations in the project vicinity.
Table 3.10-1: Surrounding Land Use Designations

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Relationship to Project Site</th>
<th>Land Use Designation</th>
<th>East Orange General Plan</th>
<th>Orange Park Acres Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villa Park Landfill (Closed)</td>
<td>West</td>
<td>Open Space</td>
<td>S-G (Sand and Gravel)</td>
<td>N/A</td>
</tr>
<tr>
<td>Single-family residential neighborhood</td>
<td>North</td>
<td>Low Density Residential</td>
<td>R-1-8 (Single-family residential; 8,000 square feet)</td>
<td>N/A</td>
</tr>
<tr>
<td>Santiago Oaks Regional Park</td>
<td>East</td>
<td>Open Space Park</td>
<td>R-O (Recreation Open Space)</td>
<td>N/A</td>
</tr>
<tr>
<td>Single-family residential neighborhood</td>
<td>East</td>
<td>Estate Low Density Residential</td>
<td>R-1-40 (Single-family residential; 40,000 square feet)</td>
<td>Low Density Residential</td>
</tr>
<tr>
<td>Salem Lutheran Church and School</td>
<td>South</td>
<td>Public Facilities Institutions</td>
<td>SP-P-I (Specific Plan Public Institution)</td>
<td>N/A</td>
</tr>
<tr>
<td>Mara Brandman Arena</td>
<td>South</td>
<td>Estate Low Density Residential</td>
<td>R-1-40 (Single-family residential; 40,000 square feet)</td>
<td>Low Density Residential</td>
</tr>
<tr>
<td>Single-family residential neighborhood</td>
<td>South</td>
<td>Estate Low Density Residential</td>
<td>R-1-8 (Single-family residential; 8,000 square feet)/R-1-20 (Single-family residential; 20,000 square feet)</td>
<td>Low Density Residential</td>
</tr>
</tbody>
</table>

Source: City of Orange, 2016.

**East Orange General Plan**

The East Orange General Plan was adopted in 1975 and encompasses approximately 1,900 acres. In accordance with the City of Orange Planning Division, approximately 37 acres of the project site are located within the boundaries of the 1975 East Orange General Plan. The project site constitutes approximately 2 percent of the overall East Orange General Plan acreage. The East Orange General Plan designates the project site as “Regional Park.” Exhibit 3.10-1 depicts the portion of the proposed project that is within the East Orange General Plan.

**Orange Park Acres Plan**

The Orange Park Acres Plan (OPA Plan) was adopted on December 26, 1973. In accordance with the City of Orange Planning Division, approximately 39 acres of the project site are presently located within the boundaries of the existing OPA Plan. There are approximately 1,794 total acres in the OPA Plan. The project site is approximately 3 percent of the overall OPA Plan acreage. The OPA Plan designates this area as “Santiago Greenbelt Plan.” Exhibit 3.10-2 depicts the portion of the proposed project that is within the OPA Plan.
Central/Coastal Natural Community Conservation Plan and Habitat Conservation Plan

The project site is within the central subregion of the County of Orange Central/Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan (NCCP/HCP). The NCCP/HCP is intended to protect and manage coastal sage scrub habitat and coastal sage scrub-obligate species, as well as other covered habitats and species, and mitigate anticipated impacts on those habitats and species on a programmatic, subregional level.

3.10.3 - Regulatory Framework

Regional

Central/Coastal Natural Community Conservation Plan and Habitat Conservation Plan

The project site is within the central subregion of the County of Orange Central/Coastal Subregion NCCP/HCP (Exhibit 3.4-6). The NCCP/HCP was reviewed and approved by the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) in 1996 to address protection and management of coastal sage scrub habitat and coastal sage scrub-obligate species, as well as other covered habitats and species, and mitigate anticipated impacts on those habitats and species on a programmatic, subregional level rather than on a project-by-project, single-species basis. A habitat reserve in excess of 37,000 acres was established for the protection of coastal sage scrub, other upland habitats, the coastal California gnatcatcher, and the other primarily coastal sage scrub-dependent species identified in the NCCP/HCP. Specifically, the NCCP/HCP, the USFWS, and the CDFW authorized take of 39 identified species of plants and wildlife (including covered and conditionally covered species). Further, the NCCP/HCP contains requirements for adaptive management, interim management, and funding management for the reserve as well as procedures and minimization measures related to the take of identified species and habitat. Thus, the NCCP/HCP provides for the protection and management of a broad range of plant and wildlife populations while providing certainty to the public and affected landowners with respect to the location of future development and open space in the subregion.

The NCCP/HCP provides for the protection of a number of plant and animal species, referred to as Target Species and Identified Species. There are also identified NCCP/HCP species that have conditional regulatory coverage under the NCCP/HCP referred to as conditionally covered Identified Species. The conservation and management of these species is provided for under the NCCP. A development activity authorized under the NCCP/HCP necessarily includes protection of these species and also means that no further action under CESA or FESA is required for the approved activity should any of the Target or Identified Species be subsequently listed as endangered or threatened under either of these Acts. As a consequence, Target and Identified Species are considered sensitive.

Local

City of Orange

General Plan

The City of Orange General Plan serves as the City of Orange’s land use and development policy document and identifies how the City will grow and conserve its resources. The General Plan
contains the following elements: Land Use, Circulation and Mobility, Growth Management, Natural Resources, Public Safety, Noise, Cultural Resources & Historic Preservation, Infrastructure, Urban Design, and Economic Development. Within each element, the General Plan sets forth goals and policies to guide future development and land use activities.

The project site is currently designated “Resource Area,” “Low Density Residential” and “Open Space” by the General Plan. In accordance with the proposed project: The portion of the site north of Santiago Creek, currently designated as "Low Density Residential," is proposed to be re-designated as "Open Space" and the portion of the site currently designated as “Resource Area” is proposed to be re-designated to “Low Density Residential,” and “Open Space.” Refer to Impact LUP-1 for further discussion of the proposed General Plan Amendment.

**Municipal Code**

The City of Orange Municipal Code governs development and land use activities within the Orange City limits. Within the Municipal Code is the Zoning Code (Title 17), which establishes zoning districts and associated development standards and allowable/conditional uses.

The project site is zoned “S-G (Sand and Gravel)” and “R-1-8 (Single Family Residential 8,000 square feet)” by the Zoning Code. The site is proposed to be rezoned to “SP (Specific Plan).” Refer to Impact LUP-2 for further discussion of the proposed rezoning.

**3.10.4 - Methodology**

FCS personnel performed site reconnaissance of the project site in December 2016. FCS documented existing conditions with digital photographs and notes. FCS reviewed the City of Orange General Plan, the City of Orange Municipal Code, the East Orange General Plan, and the Orange Park Acres Plan for provisions applicable to the proposed project. Finally, FCS reviewed project plans for consistency with the relevant provisions of the General Plan and Municipal Code.

**3.10.5 - 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? (Refer to Section 7, Effects Found Not To Be Significant)

- 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?
3.10.6 - Project Impacts Mitigation Measures

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

General Plan Consistency

| Impact LUP-1: | The project would not conflict with any of the applicable provisions of the City of Orange General Plan |

**Impact Analysis**

This impact evaluates (1) the proposed General Plan Amendment’s compatibility with the City of Orange General Plan and surrounding land uses and (2) the proposed project’s consistency with the applicable goals and policies of the General Plan.

**General Plan Amendment**

The project site is currently designated “Resource Area,” “Low Density Residential,” and “Open Space...” The “Resource Area” land use designation reflects the current surface mining activities that occurred on the south side of Santiago Creek. The “Low Density Residential” designation applies to the portion of the site north of Santiago Creek, adjacent to Mabury Avenue. The “Open Space” designation applies to a relatively narrow strip running through the site from east to west and roughly following Santiago Creek.

The proposed project involves the development of 129 dwelling units on approximately 40 acres within the area currently designated “Resource Area” and the preservation of the remaining 69 acres (which overlap with the “Resource Area” and “Low Density Residential” designations) as open space and recreation uses. Accordingly, the applicant is proposing to change the “Resource Area” designation to a combination of “Low Density Residential,” and “Open Space”; and the “Low Density Residential” designation to “Open Space.” The area currently designated “Open Space” will remain “Open Space.”

These land use changes are necessary to allow the proposed development on the site, and are consistent and compatible with the other surrounding residential land use designations; refer to Table 3.10-2. With implementation of the General Plan Amendment, the project will be consistent with the City of Orange General Plan.

Finally, the General Plan Amendment would remove the “Low Density Residential” portions of the project site, north of Santiago Creek, from the East Orange General Plan and Orange Park Acres Plan. The purpose of removing these portions from the East Orange General Plan and the Orange Park Acres Plan would serve to reconcile any inconsistencies between the Specific Plan Land Use Designations and the designations in each of the two plans.

Impacts would be less than significant.
General Plan Consistency Analysis
Table 3.10-2 evaluates project consistency with the applicable goals and policies of the City of Orange General Plan. As shown in the table, the proposed project is consistent with all applicable goals and policies. Impacts would be less than significant.

Table 3.10-2: General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use</td>
<td>Goal 1.0</td>
<td><strong>Consistent</strong>: The proposed project would redevelop a site previously used for surface mining activities to support up to 129 dwelling units and open space and recreation uses. This is consistent with the goal of meeting current and future needs with a diverse and balanced mix of land uses.</td>
</tr>
<tr>
<td></td>
<td>Policy 1.1</td>
<td><strong>Consistent</strong>: The proposed project would develop up to 129 dwelling units in a city and county that are considered “jobs rich.” Thus, the project would promote jobs-housing balance.</td>
</tr>
<tr>
<td></td>
<td>Policy 1.2</td>
<td><strong>Consistent</strong>: The proposed project promotes land use compatibility with surrounding residential development by clustering the new dwelling units on 40 acres of the site adjacent to E. Santiago Canyon Road and preserving the remaining acreage for open space and recreation use. This is consistent with the policy of balancing economic benefits with the preservation of neighborhood character.</td>
</tr>
<tr>
<td></td>
<td>Policy 1.3</td>
<td><strong>Consistent</strong>: The proposed project would develop 129 new single-family dwelling units and, thus, provide new housing opportunities.</td>
</tr>
</tbody>
</table>
### Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy 1.4</td>
<td></td>
<td>Ensure that new development reflects existing design standards, qualities, and features that are in context with nearby development.</td>
<td><strong>Consistent:</strong> The proposed project promotes land use compatibility with surrounding residential development by clustering the new dwelling units on 40 acres of the site adjacent to E. Santiago Canyon Road and preserving the remaining acreage for open space and recreation use. Additionally, the density and housing products are similar to the residential uses to the north, east, and south.</td>
</tr>
<tr>
<td>Policy 1.7</td>
<td></td>
<td>Provide a range of open space and park amenities to meet the diverse needs of current and new residents.</td>
<td><strong>Consistent:</strong> The proposed project would provide publicly accessible open space and recreation uses, including a trail network.</td>
</tr>
<tr>
<td>Goal 6.0</td>
<td></td>
<td>Advance development activity that is mutually beneficial to both the environment and the community.</td>
<td><strong>Consistent:</strong> The proposed project would cluster the new dwelling units on 40 acres of the site near E. Santiago Canyon Road and preserve the remaining acreage as open space and recreation. The latter uses include the Santiago Creek corridor, which would be preserved as a greenway.</td>
</tr>
<tr>
<td>Policy 6.1</td>
<td></td>
<td>Ensure that new development is compatible with the style and design of established structures and the surrounding environment.</td>
<td><strong>Consistent:</strong> The proposed project promotes land use compatibility with surrounding residential development by clustering the new dwelling units on 40 acres of the site adjacent to E. Santiago Canyon Road and preserving the remaining acreage for open space and recreation use. Additionally, the density and housing products are similar to the residential uses to the north, east, and south.</td>
</tr>
<tr>
<td>Policy 6.3</td>
<td></td>
<td>Establish and maintain greenways, and pedestrian and bicycle connections that complement the residential, commercial and open space areas they connect.</td>
<td><strong>Consistent:</strong> The proposed project would protect the Santiago Creek corridor as a greenway and develop a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park.</td>
</tr>
</tbody>
</table>
**Table 3.10-2 (cont.): General Plan Consistency Analysis**

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy 6.5</td>
<td></td>
<td>Reduce pollutant runoff from new development and urban runoff to the maximum extent practicable.</td>
<td><strong>Consistent:</strong> The proposed project’s storm drainage system would incorporate Low Impact Development concepts that promote on-site percolation instead of off-site discharge.</td>
</tr>
<tr>
<td>Policy 6.6</td>
<td></td>
<td>Enhance the walkability of both new and current development.</td>
<td><strong>Consistent:</strong> The proposed project would include sidewalks along internal streets and a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park.</td>
</tr>
<tr>
<td>Policy 6.10</td>
<td></td>
<td>Mitigate adverse air, noise, circulation, and other environmental impacts caused by new development adjacent to existing neighborhoods through use of sound walls, landscaping buffers, speed limits, and other traffic control measures.</td>
<td><strong>Consistent:</strong> The proposed project promotes land use compatibility with surrounding residential development by clustering the new dwelling units on approximately 40 acres of the site adjacent to E. Santiago Canyon Road and preserving the remaining acreage for open space and recreation use. Additionally, the proposed project would employ a landscaped buffer with the residential uses to the east.</td>
</tr>
<tr>
<td>Circulation</td>
<td>Goal 1.0</td>
<td>Provide a safe, efficient, and comprehensive circulation system that serves local needs, meets forecasted demands, and sustains quality of life in neighborhoods.</td>
<td><strong>Consistent:</strong> The proposed project would develop an internal street network that connects to E. Santiago Canyon Road. The proposed project would also include pedestrian facilities consisting of a trail network.</td>
</tr>
<tr>
<td>Policy 1.1</td>
<td></td>
<td>Plan, build, and maintain an integrated, hierarchical, and multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City.</td>
<td><strong>Consistent:</strong> The proposed project would develop new internal roadways and pedestrian facilities consisting of a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park. Additionally, project streets and the trail network would be accessible to bicycles. These attributes are consistent with the policy of developing a multi-modal transportation system.</td>
</tr>
</tbody>
</table>
### Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy 1.7</td>
<td></td>
<td>Consolidate driveways along roadways that provide access to commercial uses to minimize side street interruption and promote smooth traffic flows</td>
<td><strong>Consistent:</strong> The proposed project would have only two vehicular access points on E. Santiago Canyon Road.</td>
</tr>
<tr>
<td>Goal 4.0</td>
<td></td>
<td>Provide efficient and accessible modes of pedestrian, bicycle, and equestrian transportation and improved facilities and amenities.</td>
<td><strong>Consistent:</strong> The proposed project would develop pedestrian facilities consisting of a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park. Additionally, project streets and the trails would be accessible to bicycles. Equestrians would also be able to use the trails.</td>
</tr>
<tr>
<td>Policy 4.1</td>
<td></td>
<td>Create a comprehensive bicycle network that is integrated with other transportation systems by establishing complementary on-street and off-street facilities as identified in the City of Orange Bikeways Master Plan and OCTA Commuter Bikeways Strategic Plan, including Santiago Creek, the Santa Ana River, and the Tustin Branch Trail.</td>
<td><strong>Consistent:</strong> The proposed trail network includes facilities contemplated by the City’s and OCTA’s bikeways plans.</td>
</tr>
<tr>
<td>Growth Management</td>
<td>Goal 1.0</td>
<td>Reduce traffic congestion within the City.</td>
<td><strong>Consistent:</strong> The proposed project’s impacts on traffic are evaluated in Section 3.16, Transportation. Local intersections were evaluated against the City’s adopted performance standards and mitigation measures were proposed to improve deficient operations to acceptable levels. This is consistent with the goal of reducing traffic congestion.</td>
</tr>
<tr>
<td>Policy 1.1</td>
<td></td>
<td>Establish LOS D as the level of service standard for traffic circulation within the City for both roadway segments and peak-hour signalized intersection movements.</td>
<td><strong>Consistent:</strong> LOS D was used as the basis for evaluating project impacts on intersection operations. Refer to Section 3.16, Transportation for further discussion.</td>
</tr>
<tr>
<td>Policy 1.2</td>
<td></td>
<td>Ensure completion of transportation improvements as agreed upon by the City and developer prior to completion of a development project.</td>
<td><strong>Consistent:</strong> All vehicular access points (including the improved intersection of E. Santiago Canyon Road/N. Nicky Way) would be required to be completed in...</td>
</tr>
</tbody>
</table>
Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy 1.3</td>
<td></td>
<td>Ensure that new development pays its fair share of street improvement costs, including regional traffic mitigation. New revenues generated from Measure M, if available, shall not be used to replace private developer funding which has been omitted for any project.</td>
<td><strong>Consistent:</strong> The project applicant would install a signal and intersection improvements at the entrance to the project on E. Santiago Canyon Road/N. Nicky Way and contribute fair-share fees to improvements at Orange Park Boulevard/Santiago Canyon Road and Chapman Avenue/Santiago Canyon Road. Refer to Section 3.16, Transportation for further discussion.</td>
</tr>
<tr>
<td>Policy 1.4</td>
<td></td>
<td>Continue to collect transportation impact fees for improvements within the City boundaries and work with adjacent jurisdictions to determine that an appropriate level of transportation impact fees are maintained within the established County GMAs.</td>
<td><strong>Consistent:</strong> The project applicant will pay all adopted transportation fees at the time building permits are sought.</td>
</tr>
<tr>
<td>Policy 1.9</td>
<td></td>
<td>Ensure that new developments incorporate non-motorized and alternative transit amenities such as bike racks, bus benches and shelters, and pedestrian connections</td>
<td><strong>Consistent:</strong> The proposed project would develop pedestrian facilities consisting of sidewalks along streets and a new creek trail that would connect N. Cannon Street to Santiago Oaks Regional Park.</td>
</tr>
<tr>
<td>Policy 2.3</td>
<td></td>
<td>Continue to work toward achieving a balance between residential, industrial, commercial, and public land uses. Support programs that match Orange residents with local jobs to reduce long commutes and improve the fiscal and public health of the community.</td>
<td><strong>Consistent:</strong> The proposed project would develop 129 new dwelling units in a City and County that are “jobs rich.” Thus, the new housing opportunities would promote the objective of balancing residential and non-residential development.</td>
</tr>
<tr>
<td>Policy 2.4</td>
<td></td>
<td>Explore infill development or mixed-use opportunities wherever possible as developable space becomes more limited.</td>
<td><strong>Consistent:</strong> The project site is located within the Orange city limits on a major arterial roadway and is surrounded by existing residential uses on three sides. Thus, the proposed project would be considered an “infill project.”</td>
</tr>
</tbody>
</table>
### Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>Goal/Policy</th>
<th>Text</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Resources</td>
<td>Goal 1.0</td>
<td>Provide recreational use, scenic enjoyment, and the protection of natural resources and features in open space areas.</td>
<td><strong>Consistent:</strong> The proposed project would provide acreage for open space and recreation use, which would include a creek trail. This acreage encompasses the Santiago Creek corridor, the most significant natural feature within the project site.</td>
</tr>
<tr>
<td>Policy 1.3</td>
<td></td>
<td>Promote development of additional open spaces and access points adjacent to waterways and planned trails.</td>
<td><strong>Consistent:</strong> The proposed project would provide acreage for open space and recreation use, including a greenway along Santiago Creek. Within the greenway would be a trail network, which would allow public access to the waterway.</td>
</tr>
<tr>
<td>Goal 2.0</td>
<td></td>
<td>Protect air, water, and energy resources from pollution and overuse.</td>
<td><strong>Consistent:</strong> This EIR evaluates project impacts associated with air quality, hydrology and water quality, and utility systems and sets forth mitigation measures where necessary to protect resources.</td>
</tr>
<tr>
<td>Policy 2.1</td>
<td></td>
<td>Cooperate with the South Coast Air Quality Management District (SCAQMD) and other regional agencies to implement and enforce regional air quality management plans.</td>
<td><strong>Consistent:</strong> This EIR uses SCAQMD’s guidance to assess air quality impacts. Refer to Section 3.3, Air Quality for further discussion.</td>
</tr>
<tr>
<td>Policy 2.2</td>
<td></td>
<td>Support alternative transportation modes, alternative technologies, and bicycle- and pedestrian-friendly neighborhoods to reduce emissions related to vehicular travel.</td>
<td><strong>Consistent:</strong> The proposed project would develop pedestrian facilities consisting of sidewalks along streets and a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park. These facilities would facilitate alternative transportation modes of travel.</td>
</tr>
<tr>
<td>Policy 2.13</td>
<td></td>
<td>Control surface runoff water discharges into the stormwater conveyance system to comply with the City’s National Pollutant Discharge Elimination System (NPDES) Municipal Permit and other regional permits issued by the Santa Ana Regional Water Quality Control Board.</td>
<td><strong>Consistent:</strong> The proposed project’s storm drainage system would comply with the applicable provisions of the regional permits for stormwater management. Refer to Section 3.9, Hydrology and Water Quality for further discussion.</td>
</tr>
<tr>
<td>Policy 2.14</td>
<td></td>
<td>Reduce pollutant runoff from new development by requiring use of</td>
<td><strong>Consistent:</strong> The proposed project’s storm drainage system would</td>
</tr>
</tbody>
</table>
Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>3.10.1</td>
<td>the most low development impact practices and effective Best Management Practices (BMPs) currently available.</td>
<td>incorporate Low Impact Development concepts that promote on-site percolation instead of off-site discharge. Refer to Section 3.9, Hydrology and Water Quality for further discussion.</td>
</tr>
<tr>
<td>Policy 2.15</td>
<td></td>
<td>Minimize the amount of impervious surfaces and associated urban runoff pollutants in new development and significant redevelopment throughout the community.</td>
<td>Consistent: The proposed project would cluster residential development on approximately 40 acres of the site and preserve the remaining acreage as open space and recreational uses. These latter uses would be expected to be primarily natural, pervious surfaces and, thus, they would generate very little to no polluted runoff.</td>
<td></td>
</tr>
<tr>
<td>Policy 2.16</td>
<td></td>
<td>Protect in-stream habitat and natural stream and channel features.</td>
<td>Consistent: The proposed project would establish a greenway along Santiago Creek, which would facilitate the protection of riparian habitat.</td>
<td></td>
</tr>
<tr>
<td>Goal 4.0</td>
<td></td>
<td>Conserve and protect wildlife habitat, plant and animal species of concern, and general biodiversity.</td>
<td>Consistent: The proposed project would preserve more than half the site for open space and recreational use. This includes a greenway along Santiago Creek, which is the most significant biological feature within the project site.</td>
<td></td>
</tr>
<tr>
<td>Policy 4.1</td>
<td></td>
<td>Preserve and protect native and habitat-supporting plant resources throughout the City.</td>
<td>Consistent: The proposed project would preserve more than half the site for open space and recreational use. This includes area that provides suitable habitat for special-status plant species.</td>
<td></td>
</tr>
<tr>
<td>Policy 4.2</td>
<td></td>
<td>Work with agencies, including the Orange County Flood Control District, to identify opportunities to enhance the natural qualities of Santiago Creek to protect habitat and reintroduce native plants and animals.</td>
<td>Consistent: The proposed project would establish a greenway along Santiago Creek, which would permanently protect the creek habitat.</td>
<td></td>
</tr>
<tr>
<td>Policy 4.4</td>
<td></td>
<td>Repair or improve ecological and biological conditions in the urban and natural environments when reviewing proposals for site</td>
<td>Consistent: The proposed project would preserve more than half the site for open space and recreational use. This includes a greenway greenery.</td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>Goal/Policy</td>
<td>Consistency Determination</td>
<td></td>
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</tr>
<tr>
<td>Policy 4.5</td>
<td>Protect the Santiago Creek and Santa Ana River corridors from premature urbanization to ensure the continued availability of important sand and gravel, flood control, water recharge, biological, and open space resources.</td>
<td>Consistent: The proposed project would establish a greenway along Santiago Creek, which would permanently protect the waterway within the project site. Additionally, the economically recoverable mineral resources within the project site have largely been depleted and, thus, the redevelopment of the site to support residential, open space, and recreational uses would not be premature.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 6.0</td>
<td>Provide for alternative modes of transportation and access to recreational resources through a multi-use trail system that links the City’s parks and regional open space amenities.</td>
<td>Consistent: The proposed project would develop a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy 6.4</td>
<td>Link existing equestrian trails and provide outlets to open space areas, particularly in the northeast region of the City, to reach regional parks such as Santiago Oaks, Irvine, Peters Canyon, and the Cleveland National Forest.</td>
<td>Consistent: The proposed project would develop a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Safety</td>
<td>Goal 2.0 Protect the City from flood-related risks and hazards.</td>
<td>Consistent: The Santiago Creek channel contains 100-year flood hazard areas. The proposed project would establish a greenway along the creek corridor and locate new residential development a minimum of 50 feet from the creek centerline in order to protect hydrological values of the creek. Additionally, all dwelling units would be located above the 100-year flood elevation. Thus, the proposed project would not increase the risk for flooding along Santiago Creek.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Element</td>
<td>No.</td>
<td>Goal/Policy</td>
<td>Consistency Determination</td>
<td></td>
</tr>
<tr>
<td>---------</td>
<td>-----</td>
<td>-------------</td>
<td>---------------------------</td>
<td></td>
</tr>
<tr>
<td>Goal 4.0</td>
<td>4.0</td>
<td>Minimize risks to life, property, and the environment associated with producing, using, storing, or transporting hazardous materials.</td>
<td><strong>Consistent</strong>: The project site was previously used for surface mining activities and contains Total Petroleum Hydrocarbon- (TPH) and trichloroethylene- (TCE) impacted soils. This Draft EIR requires that these existing conditions be abated in accordance with California Department of Toxic Substances Control (DTSC) standards as part of the development of new residential uses. Refer to Section 3.8, Hazards and Hazardous Materials for further discussion.</td>
<td></td>
</tr>
<tr>
<td>Policy 4.3</td>
<td>4.3</td>
<td>Identify hazardous materials dumpsites, and ensure that the sites are cleaned in conformance with applicable federal and state laws prior to the establishment of new uses.</td>
<td><strong>Consistent</strong>: The project site contains TPH- and TCE-impacted soil. This Draft EIR requires that these existing conditions be abated to DTSC standards as part of the development of new residential uses. Refer to Section 3.8, Hazards and Hazardous Materials for further discussion.</td>
<td></td>
</tr>
<tr>
<td>Goal 7.0</td>
<td>7.0</td>
<td>Improve community safety and reduce opportunities for criminal activity</td>
<td><strong>Consistent</strong>: The proposed project’s open space and recreational facilities would be visible from surrounding land uses and would employ appropriate safety and security measures to deter criminal activity.</td>
<td></td>
</tr>
<tr>
<td>Policy 7.4</td>
<td>7.4</td>
<td>Ensure that community areas and amenities such as transit stops, sidewalks, plazas, parks, trails, and bike paths are appropriately lighted, free of hiding places, and frequently patrolled.</td>
<td><strong>Consistent</strong>: The proposed project’s open space and recreational facilities would be visible from surrounding land uses and would employ appropriate safety and security measures to deter criminal activity.</td>
<td></td>
</tr>
<tr>
<td>Goal 9.0</td>
<td>9.0</td>
<td>Provide safe pedestrian and bicycle environments.</td>
<td><strong>Consistent</strong>: The proposed project would develop pedestrian facilities consisting of sidewalks along streets and a trail network that would connect N. Cannon Street to Santiago Oaks Regional Park. Additionally, project streets and the trails would be accessible to bicycles.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Text</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
<td>Goal 1.0</td>
<td>Promote a pattern of land uses compatible with current and future noise levels.</td>
<td>Consistent: This EIR evaluates project-related noise impacts on surrounding land uses and requires mitigation to achieve acceptable standards. Refer to Section 3.12, Noise for further discussion.</td>
<td></td>
</tr>
<tr>
<td>Policy 1.1</td>
<td>Consider potential excessive noise levels when making land use planning decisions.</td>
<td>Consistent: This EIR evaluates project-related noise impacts on surrounding land uses and requires mitigation to achieve acceptable standards. Refer to Section 3.12, Noise for further discussion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy 1.6</td>
<td>Require an acoustical study for proposed developments in areas where the existing and projected noise level exceeds or would exceed the maximum allowable levels identified in Table N-3. The acoustical study shall be performed in accordance with the requirements set forth within this Noise Element.</td>
<td>Consistent: This EIR includes an acoustical study that prepared in accordance with the Noise Element requirements. Refer to Section 3.12, Noise for further discussion.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 2.0</td>
<td>Minimize vehicular traffic noise in residential areas and near noise-sensitive land uses.</td>
<td>Consistent: The proposed project minimizes vehicular traffic noise impacts on surrounding residential uses by taking access from E. Santiago Canyon Road, an arterial roadway. No vehicular access would be taken from surrounding residential streets, thereby avoiding an increase in traffic noise levels in the most noise sensitive areas.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policy 2.1</td>
<td>Encourage noise-compatible land uses along existing and future roadways, highways, and freeways.</td>
<td>Consistent: The proposed residential uses would be set back from E. Santiago Canyon Road and would employ a solid noise barrier along the roadway to reduce exposure to traffic noise.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 7.0</td>
<td>Minimize construction, maintenance vehicle, and nuisance noise in residential areas and near noise-sensitive land uses.</td>
<td>Consistent: Construction activities would be limited to the hours prescribed by the Municipal Code and would use temporary noise barriers to protect nearby residential uses from excessive noise. Refer to Section 3.12, Noise for further discussion.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.10-2 (cont.): General Plan Consistency Analysis

<table>
<thead>
<tr>
<th>Element</th>
<th>No.</th>
<th>Goal/Policy</th>
<th>Consistency Determination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policy 7.3</td>
<td></td>
<td>Limit the hours of construction and maintenance operations located adjacent to noise-sensitive land uses.</td>
<td><strong>Consistent:</strong> Construction activities would be limited to the hours prescribed by the Municipal Code.</td>
</tr>
<tr>
<td>Cultural Resources &amp; Historic Preservation</td>
<td>Goal 4.0</td>
<td>Identify and preserve archaeological and cultural resources.</td>
<td><strong>Consistent:</strong> This EIR included a field survey for archaeological resources and sets forth mitigation measures for the inadvertent discovery of such resources during construction. Refer to Section 3.4, Cultural Resources for further discussion.</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>Goal 1.0</td>
<td>Ensure water, sewer, and storm drain systems that meet the needs of residents and businesses.</td>
<td><strong>Consistent:</strong> The proposed project would be served with potable water service provided by the City of Orange and sewer service provided by Orange County Sanitation District (OCSD). The proposed project would install a storm drainage system that adheres to City design standards. These characteristics are consistent with the goal of providing utility systems that meet the needs of residents.</td>
</tr>
<tr>
<td>Policy 1.6</td>
<td></td>
<td>Require that new developments fund fair-share costs associated with City provision of water, sewer, and storm drain service and are consistent with City and service provider plans to complete needed improvements and funding capacity for such improvements.</td>
<td><strong>Consistent:</strong> The proposed project would be responsible for the full cost of all requisite water, sewer, and storm drainage facilities necessary to serve the project.</td>
</tr>
<tr>
<td>Goal 4.0</td>
<td></td>
<td>Ensure adequate provision of electricity, natural gas, telephone and data services and cable television.</td>
<td><strong>Consistent:</strong> The proposed project would be served with electricity service provided by Southern California Edison and natural gas service provided by the Southern California Gas Company. These characteristics are consistent with</td>
</tr>
<tr>
<td>Element</td>
<td>No.</td>
<td>Goal/Policy</td>
<td>Consistency Determination</td>
</tr>
<tr>
<td>------------------</td>
<td>-----</td>
<td>---------------------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the goal of ensuring the adequate provision of utilities.</td>
<td></td>
</tr>
<tr>
<td>Policy 4.2</td>
<td></td>
<td>Continue to require utilities to be placed underground for new development.</td>
<td><strong>Consistent:</strong> All electrical and telecommunications connections would be located underground; no overhead facilities are proposed.</td>
</tr>
<tr>
<td>Urban Design</td>
<td>Goal 6.0</td>
<td>Encourage contextually appropriate infill development projects and property renovations.</td>
<td><strong>Consistent:</strong> The proposed project would be of an appropriate density and would provide a housing product similar to surrounding residential uses.</td>
</tr>
<tr>
<td>Policy 6.1</td>
<td></td>
<td>Encourage consistent high quality design of development projects, and provide development standards that ensure building and site design that is well integrated with infrastructure and circulation systems.</td>
<td><strong>Consistent:</strong> The proposed site plan is intended to promote land use compatibility with adjoining residential uses by clustering residential development on approximately 40 acres near E. Santiago Canyon Road and preserving the remaining acreage as open space and recreational uses. The proposed project would provide an internal street network, pedestrian facilities, and a trail network from N. Cannon Street to Santiago Oaks Regional Park. Additionally, vehicular access would be taken from E. Santiago Canyon Road, thereby avoiding adding vehicle trips to nearby residential streets. These attributes are consistent with the policy of encouraging high-quality, well-integrated projects.</td>
</tr>
<tr>
<td>Policy 6.2</td>
<td></td>
<td>Ensure that new infill development contributes positively to the quality of the surrounding corridor or neighborhood, including the potential to provide additional park space, and minimize the visibility of on-site parking.</td>
<td><strong>Consistent:</strong> The proposed project would enhance the surrounding area by redeveloping a former surface mining site to support residential, open space, and recreational uses. The project includes a greenway along Santiago Creek and a trail network connecting N. Cannon Street and Santiago Oaks Regional Park.</td>
</tr>
</tbody>
</table>

Source: FCS, 2016.
**Level of Significance Before Mitigation**
Less than significant impact.

**Mitigation Measures**
No mitigation is necessary.

**Level of Significance After Mitigation**
Less than significant impact.

**Municipal Code Consistency**

<table>
<thead>
<tr>
<th>Impact LUP-2:</th>
<th>The project would not conflict with the applicable provisions of the Orange Municipal Code.</th>
</tr>
</thead>
</table>

**Impact Analysis**
The project site is currently zoned “S-G (Sand and Gravel)” and “R-1-8 (Single Family Residential 8,000 square feet)” by the Orange Zoning Code. The “S-G (Sand and Gravel)” land use designation reflects the previous surface mining activities and the current sand and gravel operations that occur on the south side of Santiago Creek. The “R-1-8 (Single Family Residential 8,000 square feet)” applies to the portion of the site north of Santiago Creek, adjacent to Mabury Avenue.

The proposed project involves the development of 129 dwelling units on 40 acres within the area designated “S-G (Sand and Gravel)” and the preservation of the remaining acreage (which overlap with the “S-G (Sand and Gravel)” and “R-1-8 (Single Family Residential 8,000 square feet)” designations) as open space and recreation uses. Accordingly, the applicant is proposing to rezone the entire site to “SP (Specific Plan).”

These land use changes are necessary to allow the proposed development on the site, and are consistent and compatible with the other surrounding residential land use designations; refer to Table 3.10-2. With implementation of the proposed Zone Change, the project will be consistent with the Orange Municipal Code.

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.
Conservation Plan Consistency

Impact LUP-3: The project would not conflict with any applicable habitat conservation plan or natural communities conservation plan.

Impact Analysis
The project site is within the boundaries of the Orange County Central and Coastal Subregion NCCP/HCP (Exhibit 3.4-6). The NCCP/HCP has an objective of assembling a 38,000-acre preserve in Orange County consisting of the highest value biological habitat.

Within the project site, the Santiago Creek corridor contain riparian habitat and the upland areas north of the creek contain marginal Coastal Sage Scrub habitat, which are considered to have high biological value. These areas are contemplated to be preserved as open space and, therefore, would be available for inclusion in the preserve. Additionally, the 40 acres proposed for residential development coincide with the surface mining areas and do not contain any significant biological habitat. For these reasons, no conflicts with the NCCP/HCP would occur. 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.
3.11 - Mineral Resources

3.11.1 - Introduction

This section describes the existing mineral resources setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information provided by the California State Mining and Geology Board and the City of Orange.

3.11.2 - Environmental Setting

Mineral Resource Extraction Activities

The project site was used from 1919 to 1995 primarily for surface mining of sand and gravel, aggregates mining, and ancillary uses. Surface mining activities ceased in 1995 and all ancillary uses were removed in the same year. The project site currently supports a sand and gravel operator in accordance with the existing Sand and Gravel zoning.

Approximately 40 acres between Santiago Creek and E. Santiago Canyon Road contains remnants of the mining operation and is the location of the ongoing sand and gravel operation. This area is characterized by soil piles and berms, unpaved roads. An approximately 5-acre area near E. Santiago Canyon Road supports a materials recycling operation that includes apparatus for crushing boulders, bricks, rocks, and similar materials for recycling. Materials used for these operations originated primarily from off-site sources and the materials generated by these operations have historically been used both on-site and transported off-site. Ancillary uses included administration and maintenance buildings, caretaker residence, material testing laboratory, driver’s shack, rock crushing facilities, several above ground and below ground fuel storage tanks and two hot-mix asphalt plants.

Additionally, the previously mined portions of the site were “backfilled,” in which unsuitable materials were excavated and replaced with fill, pursuant to a grading permit issued by the City of Orange in 2011. It was anticipated that approximately 223,000 cubic yards of material would be imported to the site during the process, including concrete, asphalt and rock that would be crushed on-site. Approximately 2,000 cubic yards of material was anticipated to be excavated from the site for reuse and would be blended with the crushed import material for a total of 225,000 cubic yards of backfill. In 2015, the operator voluntarily temporarily suspended operations on the site, and limited rock crushing operations to a total of 15 consecutive business days in any 6-month period. The operator reserved the right to resume all operations consistent with the Sand and Gravel zoning.

Mineral Resource Designations

The California State Mining and Geology Board “Regionally Significant Construction Aggregation Resource Areas in the Orange County-Temescal Valley and San Gabriel Valley Production- Consumption Region, Santa Ana River and Lower Santiago Creek Resource Areas” indicates that the project site is within Mineral Resource Zone 2 for aggregate.

The City of Orange General Plan maps a portion of the project site as “Resource Area” and the Orange Zoning Ordinance zones a portion of the site as “S-G (Sand and Gravel Extraction).”
3.11.3 - Regulatory Framework

State

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA) provides guidelines for the classification and designation of mineral lands. The California Geological Survey has produced a report and a Mineral Land Classification Map. The Classification Map designates areas where important Production-Consumption deposits occur, and are categorized in Mineral Resource Zones (MRZs). MRZs are defined as follows:

- **MRZ-1:** Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence.
- **MRZ-2:** Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood for their presence exists.
- **MRZ-3:** Areas containing mineral deposits, the significance of which cannot be evaluated from available data.
- **MRZ-4:** Areas where available information is inadequate for assignment to another MRZ zone.

According to SMARA, mineral lands include areas containing sand and gravel, and related materials are known collectively as aggregate resources. SMARA requires all cities to contain a mineral resource management policy that:

1. Recognizes mineral information transmitted by the State Mining and Geology Boards;
2. Assists in the management of land use affecting areas of regional significance; and,
3. Emphasizes the conservation and development of identified mineral resources.

Local

City of Orange

General Plan

The City of Orange General Plan recognizes the State’s Mineral Resource Zone 2 designations along Santiago Creek and designates these areas as “Resource Area,” which allow for aggregate extraction or recreation uses.

3.11.4 - Methodology

FCS reviewed the California State Mining and Geology Board “Regionally Significant Construction Aggregation Resource Areas in the Orange County-Temescal Valley and San Gabriel Valley Production-Consumption Region, Santa Ana River and Lower Santiago Creek Resource Areas” and the City of Orange General Plan for information about mineral resources.
3.11.5 - 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) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other local land use plan?

3.11.6 - Project Impacts and Mitigation Measures

Loss of Minerals of Statewide Importance

Impact MIN-1: The proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.

**Impact Analysis**

The project site is located within Mineral Resource Zone 2 for aggregate as designated by the State Mining and Geology Board. However, aggregate production has not occurred on the project site since 1995. Furthermore, mined areas of the site have been backfilled, which effectively precludes the resumption of aggregate mining operations.

The Geotechnical Investigation prepared for the project site indicates that it has been mined of economic aggregate deposits, and the remaining deposits that are of potential economic value are infeasible to mine because of the limited volume of the localized deposits, expense of removing the overburden (pond deposits), and difficulty associated with excavation logistics. Thus, resuming aggregate mining operations on the project site would not be economically feasible and the resource is effectively depleted.

In summary, the development of the proposed project would not result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State because the economically recoverable aggregate has been previously mined and put to beneficial use. The remaining aggregate is not economically recoverable and therefore would not be available to benefit the region or the residents of the State. Therefore, the loss of mineral resources would be considered a less than significant impact.

**Level of Significance Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is necessary.

**Level of Significance After Mitigation**

Less than significant impact.
Loss of Mineral Resources of Local Importance

Impact MIN-2: The proposed project would not result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other local land use plan.

Impact Analysis

The City of Orange General Plan maps a portion of the project site as “Resource Area” and the Orange Zoning Ordinance zones a portion of the site as “S-G (Sand and Gravel Extraction).” These designations reflect the project site’s past support of aggregate mining activities, which ceased in 1995. However, they do not signify that the project site has economically recoverable aggregate deposits. Furthermore, the proposed General Plan Amendment and Rezone would remove these designations and replace them with designations that are non-mining in nature. 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.
3.12 - Noise

3.12.1 - Introduction
This section describes the existing hydrology and water quality 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 input assumptions and output data used in this analysis are provided in Appendix H.

3.12.2 - Environmental Setting
Noise Fundamentals
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 that expresses the ratio of the sound pressure level being measured to a standard reference level. 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. Table 3.12-1 shows some representative noise sources and their corresponding noise levels in dBA.

Table 3.12-1: Typical A-Weighted Noise Levels

<table>
<thead>
<tr>
<th>Indoor Noise Source</th>
<th>Noise Level (dBA)</th>
<th>Outdoor Noise Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Threshold of Hearing in Laboratory)</td>
<td>0</td>
<td>—</td>
</tr>
<tr>
<td>Library</td>
<td>30</td>
<td>Quiet Rural Nighttime</td>
</tr>
<tr>
<td>Refrigerator Humming</td>
<td>40</td>
<td>Quiet Suburban Nighttime</td>
</tr>
<tr>
<td>Quiet Office</td>
<td>50</td>
<td>Quiet Urban Daytime</td>
</tr>
<tr>
<td>Normal Conversation at 3 feet</td>
<td>60</td>
<td>Normal Conversation at 3 feet</td>
</tr>
<tr>
<td>Vacuum Cleaner at 10 feet</td>
<td>70</td>
<td>Gas Lawn Mower at 100 feet</td>
</tr>
<tr>
<td>Hair Dryer at 1 foot</td>
<td>80</td>
<td>Freight Train at 50 feet</td>
</tr>
<tr>
<td>Food Blender at 3 feet</td>
<td>90</td>
<td>Heavy-duty Truck at 50 feet</td>
</tr>
<tr>
<td>Inside Subway Train (New York)</td>
<td>100</td>
<td>Jet Takeoff at 2,000 feet</td>
</tr>
<tr>
<td>Smoke Detector Alarm at 3 feet</td>
<td>110</td>
<td>Unmuffled Motorcycle</td>
</tr>
<tr>
<td>Rock Band near stage</td>
<td>120</td>
<td>Chainsaw at 3 feet</td>
</tr>
<tr>
<td>—</td>
<td>130</td>
<td>Military Jet Takeoff at 50 feet</td>
</tr>
<tr>
<td>—</td>
<td>140</td>
<td>(Threshold of Pain)</td>
</tr>
</tbody>
</table>

Source: Compiled by FirstCarbon Solutions, 2014.
Noise Descriptors

Noise equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (Leq) represents a steady-state sound level containing the same total energy as a time-varying signal over a given sample period. The peak traffic hour Leq is the noise metric used by the California Department of Transportation (Caltrans) for traffic noise impact analyses.

The Day-Night Average Level (Ldn) is the weighted average of the intensity of a sound, with corrections for time of day and averaged over 24 hours. The time of day corrections require the addition of 10 decibels to sound levels at night between 10:00 p.m. and 7:00 a.m. While the Community Noise Equivalent Level (CNEL) is similar to the Ldn, it has another addition of 4.77 decibels to sound levels during the evening hours between 7:00 p.m. and 10:00 p.m. These additions are made to the sound levels at these periods because, compared with daytime hours, there is a decrease in the ambient noise levels during the evening and nighttime hours, which creates an increased sensitivity to sounds. For this reason, the sound seems louder in the evening and nighttime hours and is weighted accordingly. Due to the additional evening penalty CNEL values are always higher than Ldn values; however, the difference is usually between 0 and 1 dB.

Other noise rating scales of importance when assessing the annoyance factor include the maximum noise level (Lmax), 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 Lmax for short-term noise impacts. Lmax reflects peak operating conditions and addresses the annoying aspects of intermittent noise.

Noise standards in terms of percentile exceedance levels, Lnx, are often used together with the Lmax for noise enforcement purposes. When specified, the percentile exceedance levels are not to be exceeded by an offending sound over a stated time period. For example, the L10 noise level represents the level exceeded 10 percent of the time during a stated period. The L50 noise level represents the median noise level (which means that the noise level exceeds the L50 noise level half of the time, and is less than this level half of the time). The L90 noise level represents the noise level exceeded 90 percent of the time and is considered the lowest noise level experienced during a monitoring period. The L90 noise level is normally referred to as the background noise level. For a relatively steady noise, the measured Leq and L50 are approximately the same.

Tone Noise

A pure tone noise is a noise produced at a single frequency, and laboratory tests have shown that humans are more perceptible to changes in noise levels of a pure tone. For a noise source to contain a “pure tone,” there must be a significantly higher A-weighted sound energy in a given frequency band than in the neighboring bands, thereby causing the noise source to “stand out” against other noise sources. A pure tone occurs if the sound pressure level in the one-third octave band with the tone exceeds the average of the sound pressure levels of the two contiguous one-third octave bands by:

- 5 dB for center frequencies of 500 hertz (Hz) and above
- 8 dB for center frequencies between 160 and 400 Hz
- 15 dB for center frequencies of 125 Hz or less
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, ground absorption, atmospheric effects and refraction, and shielding by natural and man-made features. Sound from point sources such as air conditioning condensers radiate uniformly outward as it travels away from the source in a spherical pattern. The noise drop-off rate associated with this geometric spreading is 6 dBA per each doubling of the distance (dBA/DD). However, in order for the point source drop-off rate to provide accurate results, the nearest receiver needs to be placed a minimum distance away from the source that is greater than double the width of the noise source. Transportation noise sources such as roadways are typically analyzed as line sources, since at any given moment the receiver may be impacted by noise from multiple vehicles at various locations along the roadway. Because of the geometry of a line source, the noise drop-off rate associated with the geometric spreading of a line source is 3 dBA/DD.

Ground Absorption

The sound drop-off rate is highly 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 traffic 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/DD is typically observed over soft ground with landscaping, compared with a 6.0 dBA/DD drop-off rate over hard ground such as asphalt, concrete, stone, and very hard packed earth. For line sources, a 4.5 dBA/DD is typically observed for soft-site conditions compared with the 3.0 dBA/DD drop-off rate for hard-site conditions. Caltrans research has shown that the use of soft-site conditions is more appropriate for the application of the Federal Highway Administration (FHWA) traffic noise prediction model used in this analysis. Further, the study area is located in a semi-rural environment, and either landscaping or native vegetation exists along the sides of all analyzed roadways, which is more appropriately represented by soft-site conditions.

Traffic Noise Prediction

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.

Construction Noise Fundamentals

Construction is performed in discrete steps or phases, each of which has its own mix of equipment, and consequently, its own noise characteristics. Typical phases of construction include demolition,
excavation, grading, and building construction. 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. Construction-period noise levels are higher than background ambient noise levels, but eventually cease once construction is complete. Table 3.12-2 shows typical noise levels of construction equipment as measured at a distance of 50 feet from the operating equipment.

**Table 3.12-2: Typical Construction Equipment Maximum Noise Levels, L_{max}**

<table>
<thead>
<tr>
<th>Type of Equipment</th>
<th>Impact Device? (Yes/No)</th>
<th>Specification Maximum Sound Levels for Analysis (dBA at 50 feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pickup Truck</td>
<td>No</td>
<td>55</td>
</tr>
<tr>
<td>Pumps</td>
<td>No</td>
<td>77</td>
</tr>
<tr>
<td>Air Compressors</td>
<td>No</td>
<td>80</td>
</tr>
<tr>
<td>Backhoe</td>
<td>No</td>
<td>80</td>
</tr>
<tr>
<td>Front-End Loaders</td>
<td>No</td>
<td>80</td>
</tr>
<tr>
<td>Portable Generators</td>
<td>No</td>
<td>82</td>
</tr>
<tr>
<td>Dump Truck</td>
<td>No</td>
<td>84</td>
</tr>
<tr>
<td>Tractors</td>
<td>No</td>
<td>84</td>
</tr>
<tr>
<td>Auger Drill Rig</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Concrete Mixer Truck</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Cranes</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Dozers</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Excavators</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Graders</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Jackhammers</td>
<td>Yes</td>
<td>85</td>
</tr>
<tr>
<td>Man Lift</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Paver</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Pneumatic Tools</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Rollers</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Scrapers</td>
<td>No</td>
<td>85</td>
</tr>
<tr>
<td>Concrete/Industrial Saws</td>
<td>No</td>
<td>90</td>
</tr>
<tr>
<td>Impact Pile Driver</td>
<td>Yes</td>
<td>95</td>
</tr>
<tr>
<td>Vibratory Pile Driver</td>
<td>No</td>
<td>95</td>
</tr>
</tbody>
</table>

Groundborne Vibration Fundamentals

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 at extreme vibration levels, damage to buildings may occur. 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 consist of the rattling of windows or dishes on shelves.

Vibration Descriptors

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; it is denoted as (Lv) and is based on the rms velocity amplitude. A commonly used abbreviation is “VdB,” which in this text, is when Lv is based on the reference quantity of 1 microinch per second.

Vibration Perception

Typically, developed areas are continuously affected by vibration velocities of 50 VdB or lower. These continuous vibrations are not noticeable to humans, whose threshold of perception is around 65 VdB. Common sources that may produce perceptible vibrations are construction equipment, steel-wheeled trains, and traffic on rough roads, while traffic on smooth roads rarely produces perceptible groundborne noise or vibration.

Vibration Propagation

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. 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. All three types of vibration propagation result in earth movement that can be measured through the use of a vibration meter; however, a vibration meter only captures the amount of movement and cannot decipher between the different types 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, but 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.

Propagation of vibration through soil can be calculated using the vibration reference equation of

$$PPV = PPV\text{ ref} \times (25/D)^n \text{ (in/sec)}$$

Where:

- $PPV$ = reference measurement at 25 feet from vibration source
- $D$ = distance from equipment to property line
- $n$ = vibration attenuation rate through ground

According to Chapter 12 of the Federal Transit Administration (FTA) Transit Noise and Vibration Impact Assessment (Federal Transit Administration, 2006) manual, an “$n$” value of 1.5 is recommended to calculate vibration propagation through typical soil conditions.

**Construction Vibration Fundamentals**

Common sources of groundborne vibration include construction activities such as blasting, pile driving and operating heavy earthmoving equipment. However, construction vibration impacts on building structures are generally assessed in terms of peak particle velocity (PPV). For purposes of this analysis, project-related impacts are expressed in terms of PPV. Typical vibration source levels from construction equipment are shown in Table 3.12-3.

**Table 3.12-3: Vibration Levels of Construction Equipment**

<table>
<thead>
<tr>
<th>Construction Equipment</th>
<th>PPV at 25 Feet (inches/second)</th>
<th>RMS Velocity in Decibels (VdB) at 25 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Trucks</td>
<td>0.001</td>
<td>57</td>
</tr>
<tr>
<td>Scraper</td>
<td>0.002</td>
<td>58</td>
</tr>
<tr>
<td>Bulldozer—small</td>
<td>0.003</td>
<td>58</td>
</tr>
<tr>
<td>Jackhammer</td>
<td>0.035</td>
<td>79</td>
</tr>
<tr>
<td>Concrete Mixer</td>
<td>0.046</td>
<td>81</td>
</tr>
<tr>
<td>Concrete Pump</td>
<td>0.046</td>
<td>81</td>
</tr>
<tr>
<td>Paver</td>
<td>0.046</td>
<td>81</td>
</tr>
<tr>
<td>Pickup Truck</td>
<td>0.046</td>
<td>81</td>
</tr>
<tr>
<td>Auger Drill Rig</td>
<td>0.051</td>
<td>82</td>
</tr>
<tr>
<td>Backhoe</td>
<td>0.051</td>
<td>82</td>
</tr>
<tr>
<td>Crane (Mobile)</td>
<td>0.051</td>
<td>82</td>
</tr>
<tr>
<td>Excavator</td>
<td>0.051</td>
<td>82</td>
</tr>
<tr>
<td>Grader</td>
<td>0.051</td>
<td>82</td>
</tr>
<tr>
<td>Loader</td>
<td>0.051</td>
<td>82</td>
</tr>
</tbody>
</table>
Table 3.12-3 (cont.): Vibration Levels of Construction Equipment

<table>
<thead>
<tr>
<th>Construction Equipment</th>
<th>PPV at 25 Feet (inches/second)</th>
<th>RMS Velocity in Decibels (VdB) at 25 Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loaded Trucks</td>
<td>0.076</td>
<td>86</td>
</tr>
<tr>
<td>Bulldozer—Large</td>
<td>0.089</td>
<td>87</td>
</tr>
<tr>
<td>Caisson drilling</td>
<td>0.089</td>
<td>87</td>
</tr>
<tr>
<td>Vibratory Roller (small)</td>
<td>0.101</td>
<td>88</td>
</tr>
<tr>
<td>Compactor</td>
<td>0.138</td>
<td>90</td>
</tr>
<tr>
<td>Clam shovel drop</td>
<td>0.202</td>
<td>94</td>
</tr>
<tr>
<td>Vibratory Roller (large)</td>
<td>0.210</td>
<td>94</td>
</tr>
<tr>
<td>Pile Driver (impact-typical)</td>
<td>0.644</td>
<td>104</td>
</tr>
<tr>
<td>Pile Driver (impact-upper range)</td>
<td>1.518</td>
<td>112</td>
</tr>
</tbody>
</table>

Source: Compilation of scientific and academic literature, generated by FTA and FHWA.

Existing Conditions

The project site consists of 12 parcels and is bisected by Santiago Creek in an east-west direction. The approximately 109-acre project site is located at 6118 East Santiago Canyon Road in the Orange Park Acres neighborhood of the City of Orange, Orange County, California. The project site is surrounded by the Villa Park Landfill Site, and North Cannon Street (west), single-family residential and Mabury Avenue (north), the Santiago Creek corridor and single-family residential (east), and East Santiago Canyon Road (south). The approximately 109-acre project site contains disturbed, gently sloping undeveloped land that previously supported mining activities.

Existing Noise Sources

The predominant existing noise source at the project site would be on-site activities of aggregate mining, materials recycling, and backfilling and firewood storage activities. Traffic noise along East Santiago Canyon Road is the dominant noise source in the project vicinity. To a lesser extent, other noise sources in the project vicinity include stationary noise sources such as typical neighbor maintenance and leisure activities, recreational activity at the school to the south and Santiago Creek open space to the north and equestrian facilities to the south. The existing ambient noise environment is considered relative quiet in the existing residential areas located further away from East Santiago Canyon Road.

Existing Traffic Noise

The most significant noise source in the project vicinity is traffic on East Santiago Canyon Road. In order to provide a baseline of the existing traffic noise levels in the proposed project study area, the SoundPlan Model was used to calculate the existing noise levels along roadway segments in the project vicinity, which are summarized below in Table 3.12-4. This model requires parameters,
including traffic volumes, vehicle mix, vehicle speed, and roadway geometry to compute typical equivalent noise levels during daytime, evening, and nighttime hours. The daily traffic volumes were obtained from *The Trails at Santiago Creek Draft Traffic Impact Analysis*, (Traffic Analysis) prepared by Linscott Law & Greenspan, December 2017, as presented in Section 3.16, Transportation and Traffic. The model’s inputs and outputs and summary of the modeling results for Existing traffic conditions—are provided in Appendix H of this document. The SoundPlan model was also used to produce a noise contour map showing the existing dBA CNEL in the project vicinity and is shown below in Exhibit 3.12-1, Existing Noise Contour Map (dBA CNEL).

**Table 3.12-4: Existing Traffic Noise Levels Along Modeled Roadways**

<table>
<thead>
<tr>
<th>Roadway—Segment Description</th>
<th>CNEL (dBA) at 50 feet from outermost travel lane</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannon Street—North of Santiago Canyon Road</td>
<td>67</td>
</tr>
<tr>
<td>Santiago Canyon Road—East of Cannon Street</td>
<td>65</td>
</tr>
<tr>
<td>Mabury Avenue—East of Serrano Avenue</td>
<td>53</td>
</tr>
</tbody>
</table>


### 3.12.3 - Regulatory Framework

**Federal**

**United States Environmental Protection Agency (EPA)**

In 1972, Congress enacted the Noise Control Act. This act authorized the EPA to publish descriptive data on the effects of noise and establish levels of sound “requisite to protect the public welfare with an adequate margin of safety.” These levels are separated into health (hearing loss levels) and welfare (annoyance levels) categories, as shown in Table 3.12-5. The EPA cautions that these identified levels are not standards because they do not take into account the cost or feasibility of achieving the levels.

**Table 3.12-5: Summary of EPA Recommended Noise Levels to Protect Public Welfare**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Level</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hearing loss</td>
<td>$L_{eq}(24) \leq 70 \text{ dB}$</td>
<td>All areas.</td>
</tr>
<tr>
<td>Outdoor activity interference and annoyance</td>
<td>$L_{dn} \leq 55 \text{ dB}$</td>
<td>Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.</td>
</tr>
<tr>
<td></td>
<td>$L_{eq}(24) \leq 55 \text{ dB}$</td>
<td>Outdoor areas where people spend limited amounts of time, such as schoolyards, playgrounds, etc.</td>
</tr>
<tr>
<td>Indoor activity interference and annoyance</td>
<td>$L_{eq} \leq 45 \text{ dB}$</td>
<td>Indoor residential areas.</td>
</tr>
<tr>
<td></td>
<td>$L_{eq}(24) \leq 45 \text{ dB}$</td>
<td>Other indoor areas with human activities such as schools, etc.</td>
</tr>
</tbody>
</table>

Exhibit 3-12.1
Existing Noise Contour Map

Source: SoundPlan Version 8.0.
For protection against hearing loss, 96 percent of the population would be protected if sound levels are less than or equal to an $L_{eq}^{(24)}$ of 70 dBA. The “(24)” signifies an $L_{eq}$ duration of 24 hours. The EPA activity and interference guidelines are designed to ensure reliable speech communication from a distance of approximately 5 feet in the outdoor environment. For outdoor and indoor environments, interference with activity and annoyance should not occur if levels are below 55 dBA and 45 dBA, respectively.

**Federal Transit Administration (FTA)**

The proposed project is not subject to the regulation requirements of the FTA; however, the FTA’s vibration impact criteria are accepted industrywide as the best vibration impact guidelines when a local governing agency does not have vibration standards of its own.

The FTA’s vibration impact criteria and impact assessment guidelines are published in its Transit Noise and Vibration Impact Assessment document. The FTA guidelines include thresholds for construction vibration impacts for various structural categories as shown in Table 3.12-6.

<table>
<thead>
<tr>
<th>Structure and Condition</th>
<th>Maximum Peak Particle Velocity (inches/second)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinforced-concrete, steel or timber structures (e.g., industrial buildings)</td>
<td>0.5</td>
</tr>
<tr>
<td>Engineered concrete and masonry</td>
<td>0.3</td>
</tr>
<tr>
<td>Non-engineered timber and masonry buildings (e.g., residential)</td>
<td>0.2</td>
</tr>
<tr>
<td>Buildings extremely susceptible to vibration damage (e.g., historic or very old buildings)</td>
<td>0.12</td>
</tr>
</tbody>
</table>


**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. The State also includes noise requirements in the California Code of Regulations, Title 24 (known as the Building Standards Administrative Code), Part 11 (known as the California Green Building Standards Code). The noise insulation standards require that the wall and roof-ceiling assemblies of new non-residential developments that are exposed to exterior noise in excess of 65 dBA CNEL shall meet a composite Standard Transmission Class (STC) rating of at least 50, with exterior windows of a minimum STC rating of 40. In addition, the standards require preparation of an acoustical analysis demonstrating the manner in which dwelling units have been designed to
meet this standard, where such development is proposed in an area with exterior noise levels greater than 65 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. The guidelines rank noise and land use compatibility in terms of normally acceptable, conditionally acceptable, normally unacceptable, and clearly unacceptable. The City of Orange has adopted and modified the State’s land use compatibility guidelines, as discussed in the local regulatory section below.

Local

City of Orange

General Plan

The City of Orange General Plan sets forth the following goals and policies that are relevant to noise. Orange has developed its own land use compatibility standards that rate compatibility in terms of only normally acceptable. Using these land use compatibility guidelines, the City has established interior and exterior noise standards. Higher exterior noise levels are permitted for multiple-family housing and housing in mixed-use contexts than for single-family houses. This is because multiple-family complexes are generally located in transitional areas between single family and commercial districts or in proximity to major arterials served by transit, and a more integrated mix of residential and commercial activity (accompanied by higher noise levels) is often desired in mixed-use areas close to transit routes. The following are the goals, policies, and land use compatibility standards relevant to the project:

- **Goal 1.0**: Promote a pattern of land uses compatible with current and future noise levels.
- **Policy 1.1**: Consider potential excessive noise levels when making land use planning decisions.
- **Policy 1.2**: Encourage new development projects to provide sufficient spatial buffers to separate excessive noise generating land uses and noise-sensitive land uses.
- **Policy 1.4**: Ensure that acceptable noise levels are maintained near noise-sensitive uses.
- **Policy 1.6**: Require an acoustical study for proposed developments in areas where the existing and projected noise level exceeds or would exceed the maximum allowable levels identified in Table 3.12-7 (Table N-3 of the General Plan). The acoustical study shall be performed in accordance with the requirements set forth within this Noise Element.
- **Goal 2.0**: Minimize vehicular traffic noise in residential areas and near noise-sensitive land uses.
- **Policy 2.2**: Encourage coordinated site planning and traffic control measures that minimize traffic noise in noise-sensitive land use areas.
- **Goal 7.0**: Minimize construction, maintenance vehicle, and nuisance noise in residential areas and near noise-sensitive land uses.
- **Policy 7.1**: Schedule City maintenance and construction projects so that they generate noise during less sensitive hours.
- **Policy 7.2**: Require developers and contractors to employ noise minimizing techniques during construction and maintenance operations.
• **Policy 7.3:** Limit the hours of construction and maintenance operations located adjacent to noise-sensitive land uses.

• **Policy 7.4:** Encourage limitations on the hours of operations and deliveries for commercial, mixed-use, and industrial uses abutting residential zones.

### Table 3.12-7: Maximum Allowable Noise Exposure—Transportation Sources

<table>
<thead>
<tr>
<th>Designations (as shown on Figure LU-5)</th>
<th>Land Use</th>
<th>CNEL (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Interior&lt;sup&gt;1,3&lt;/sup&gt;</td>
</tr>
<tr>
<td>Estate Low Density Residential</td>
<td>Single-family, duplex, and multiple-family</td>
<td>45</td>
</tr>
<tr>
<td>Low Density Residential</td>
<td>Mobile home park</td>
<td>N/A</td>
</tr>
<tr>
<td>Low Medium Density Residential</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medium Density Residential</td>
<td>Single-family</td>
<td>45</td>
</tr>
<tr>
<td>Neighborhood Mixed-use</td>
<td>Mobile home park</td>
<td>N/A</td>
</tr>
<tr>
<td>Neighborhood Office Professional</td>
<td>Multiple-family, mixed-use</td>
<td>45</td>
</tr>
<tr>
<td>Old Towne Mixed-use</td>
<td>Transient lodging—motels, hotels</td>
<td>45</td>
</tr>
<tr>
<td>General Commercial</td>
<td>Sports arenas, outdoor spectator sports</td>
<td>N/A</td>
</tr>
<tr>
<td>Yorba Commercial Overlay</td>
<td>Auditoriums, concert halls, amphitheaters</td>
<td>5</td>
</tr>
<tr>
<td>Urban Mixed-use</td>
<td>Office buildings, business, commercial and professional</td>
<td>50</td>
</tr>
<tr>
<td>Urban Office Professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light Industrial</td>
<td>Manufacturing, utilities, agriculture</td>
<td>N/A</td>
</tr>
<tr>
<td>Industrial</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Facilities and Institutions</td>
<td>Schools, nursing homes, day care facilities, hospitals, convalescent facilities, dormitories</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Government Facilities—offices, fire stations, community buildings</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Places of Worship, Churches</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Libraries</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Utilities</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Cemeteries</td>
<td>N/A</td>
</tr>
<tr>
<td>Recreation Commercial Open Space</td>
<td>Playgrounds, neighborhood parks</td>
<td>N/A</td>
</tr>
<tr>
<td>Open Space—Park</td>
<td>Golf courses, riding stables, water recreation, cemeteries</td>
<td>N/A</td>
</tr>
<tr>
<td>Open Space—Ridgeline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resource Area</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.12-7 (cont.): Maximum Allowable Noise Exposure—Transportation Sources

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Designations (as shown on Figure LU-5)</th>
<th>Uses</th>
<th>CNEL (dBA)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interior(^1)^(^3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. Interior habitable environment excludes bathrooms, closets and corridors.
2. Exterior noise level standard to be applied at outdoor activity areas; such as private yards, private patio or balcony of a multi-family residence. Where the location of an outdoor activity area is unknown or not applicable, the noise standard shall be applied inside the property line of the receiving land use.
3. Interior noise standards shall be satisfied with windows in the closed position. Mechanical ventilation shall be provided per Uniform Building Code (UBC) requirements.
4. Within the Urban Mixed-Use, Neighborhood Mixed-Use, Old Towne Mixed-use, and Medium Density Residential land use designations, exterior space standards apply only to common outdoor recreational areas.
5. Within Urban Mixed-Use and Medium Density Residential land use designations, exterior noise levels on private patios or balconies located within 250 feet of freeways (I-5, SR-57, SR-55, SR-22, or SR-241) and Smart Streets and Principal Arterials identified in the Circulation & Mobility Element that exceed 70 dB should provide additional common open space.

N/A=Not Applicable to specified land use category or designation

Source: Table N-3 of the City of Orange General Plan Noise Element.

When non-transportation (stationary) noise is the primary noise source, the City applies a second set of standards when planning and making development decisions. These hourly and maximum performance standards (expressed in \(L_{eq}\) and \(L_{max}\), respectively) for non-transportation or stationary noise sources are designed to protect noise sensitive land uses adjacent to stationary sources from excessive noise. Table 3.12-8 (Table N-4 of the General Plan) summarizes City stationary source noise standards for various land use types. These standards represent the acceptable exterior noise levels at the sensitive receptor.

Table 3.12-8: Maximum Allowable Noise Exposure—Stationary Noise Sources

<table>
<thead>
<tr>
<th>Noise Level Descriptor</th>
<th>Daytime (7 a.m. to 10 p.m.)</th>
<th>Nighttime (10 p.m. to 7 a.m.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Equivalent Level ((L_{eq}), dBA)</td>
<td>55</td>
<td>45</td>
</tr>
<tr>
<td>Maximum Level ((L_{max}), dBA)</td>
<td>70</td>
<td>65</td>
</tr>
</tbody>
</table>

Notes:
1. These standards apply to new or existing noise sensitive land uses affected by new or existing non-transportation noise sources, as determined at the outdoor activity area of the receiving land use. However, these noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings).
2. Each of the noise levels specified above should be lowered by five dB for simple tone noises, noises consisting primarily of speech or music, or for recurring impulsive noises. Such noises are generally considered by residents to be particularly annoying and are a primary source of noise complaints. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g. caretaker dwellings).
3. No standards have been included for interior noise levels. Standard construction practices that comply with the exterior noise levels identified in this table generally result in acceptable interior noise levels.
4. The City may impose noise level standards which are more or less restrictive than those specified above based upon determination of existing low or high ambient noise levels. If the existing ambient noise level exceeds the standards listed in Table N-4, then the noise level standards shall be increased at 3 dB increments to encompass the ambient environment. Noise level standards incorporating adjustments for existing ambient noise levels shall not exceed a maximum of 70 dB \(L_{eq}\).

Source: Table N-4 of the City of Orange General Plan Noise Element.
In addition to the maximum allowable noise level standards outlined in Tables 3.12-7 and 3.12-8, an increase in ambient noise levels is assumed to be a significant noise impact if a project causes ambient noise levels to exceed the following:

- Where the existing ambient noise level is less than 65 dBA, a project related permanent increase in ambient noise levels of 5 dBA CNEL or greater.
- Where the existing ambient noise level is greater than 65 dBA, a project related permanent increase in ambient noise levels of 3 dBA CNEL or greater.

**City of Orange Municipal Code**

The City’s Municipal Code Title 8, Health and Safety, Chapter of 8.24, Noise Control, states:

**Section 8.24.050 Exterior Noise Standards**

A. The following noise standards (Table 3.12-9, *City of Orange Municipal Code Exterior Noise Standards*), unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

<table>
<thead>
<tr>
<th>Noise Zone</th>
<th>Noise Level</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55 dB (A)</td>
<td>7:00 a.m.–10:00 p.m.</td>
</tr>
<tr>
<td>1</td>
<td>50 dB (A)</td>
<td>10:00 p.m.–7:00 a.m.</td>
</tr>
</tbody>
</table>


B. It is unlawful for any person at any location within the City to create any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person, which causes the noise level when measured on any other residential property to exceed:

1. The noise standard for a cumulative period of more than thirty minutes in any hour; or
2. The noise standard plus five dB(A) for a cumulative period of more than fifteen minutes in any hour; or
3. The noise standard plus ten dB(A) for a cumulative period of more than five minutes in any hour; or
4. The noise standard plus fifteen dB(A) for a cumulative period of more than one minute in any hour; or,
5. The noise standard plus twenty dB(A) for any period of time.

C. In the event the ambient noise level exceeds any of the five noise limit categories, designated in Subsection B of this section, the cumulative period applicable to said category shall be increased to reflect the ambient noise level. Furthermore, the maximum permissible noise level shall never exceed the maximum ambient noise level.

D. Each of the noise limits specified in Subsection B shall be reduced by five dB(A) for impact or simple tone noises, or for noises consisting of speech or music.
Section 8.24.060 Interior Noise Standards
A. The following noise standards (Table 3.12-10, City of Orange Municipal Code Interior Noise Standards), unless otherwise specifically indicated, shall apply to all residential property within a designated noise zone:

Table 3.12-10: City of Orange Municipal Code Interior Noise Standards

<table>
<thead>
<tr>
<th>Noise Zone</th>
<th>Noise Level</th>
<th>Time Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55 dB (A)</td>
<td>7:00 a.m.–10:00 p.m.</td>
</tr>
<tr>
<td>1</td>
<td>45 dB (A)</td>
<td>10:00 p.m.–7:00 a.m.</td>
</tr>
</tbody>
</table>


B. It is unlawful for any person at any location within the City to create any noise or to allow the creation of any noise, or to allow the creation of any noise on property owned, leased, occupied or otherwise controlled by such person which causes the noise level when measured within a dwelling unit on any residential property to exceed:
1. The noise standard for a cumulative period of more than five minutes in any hour; or
2. The noise standard plus five dB(A) for a cumulative period of more than one minute in any hour; or,
3. The noise standard plus ten dB(A) for any period of time.

C. In the event the ambient noise level exceeds any of the above three noise limit categories designated in Subsection B of this section, the cumulative period applicable to the category shall be increased to reflect the ambient noise level. Furthermore, the maximum permissible noise level shall never exceed the maximum ambient noise level.

D. Each of the noise limits specified above shall be reduced by five dB(A) for impact or simple tone noises, or for noises consisting of speech or music.

Section 8.24.070 Exemptions from Chapter Provisions states the following activities shall be exempted from the provisions of this chapter:

a) School bands, school athletic and school entertainment events;
b) Outdoor gatherings, public dances, shows and sporting and entertainment events provided such events are conducted pursuant to any permit requirements established by the City;
c) Activities conducted on public parks, public playgrounds, and public or private school grounds;
d) Any mechanical device, apparatus or equipment used, related to or connected with emergency machinery, vehicle or work;
e) Noise sources associated with construction, repair, remodeling, or grading of any real property, provided said activities do not take place between the hours of 8:00 P.M. and 7:00 A.M. on weekdays, including Saturday, or at any time on Sunday or a Federal holiday;
f) All mechanical devices, apparatus or equipment which are utilized for the protection or salvage of agricultural crops during periods of potential or actual frost damage or other adverse weather conditions;

g) Mobile noise sources associated with agricultural operations provided such operations do not take place between the hours of 8:00 P.M. and 7:00 A.M. on weekdays including Saturday, or at any time on Sunday or a Federal holiday;

h) Mobile noise sources associated with agricultural pest control through pesticide application, provided that the application is made in accordance with restricted material permits issued by or regulations enforced by the Agricultural Commissioner;

i) Noise sources associated with the maintenance of real property, provided such activities take place between the hours of 7:00 A.M. and 8:00 P.M. on any day except Sunday or a Federal holiday, or between the hours of 9:00 A.M. and 8:00 P.M. on Sunday or a Federal holiday;

j) Any activity to the extent regulation thereof has been preempted by State or Federal Law.

3.12.4 - Methodology

Traffic Noise Modeling Methodology

**SoundPlan**

Since the project vicinity is impacted by multiple roadways, the SoundPlan Version 7.4 noise modeling software was used. SoundPlan’s road noise algorithms are based on the FHWA Traffic Noise Model (FHWA TNM Model). The SoundPlan Model requires the input of roadways and the locations of modeled receivers. In addition, sound barriers, terrain contour lines, building placement, and specific ground coverage zones may be incorporated as well. The grading plan with elevation lines and aerial photos were used to determine the placement of the roadways and to establish the terrain in the project vicinity. The ground coverage of forest 25 feet high was used in the area immediately adjacent to Santiago Creek and loose soil was used throughout the remainder of the study area and the default temperature of 20 degrees Celsius (68 degrees Fahrenheit) and default humidity of 50 percent were used in the analysis. The modeling input assumptions and output data are provided in Appendix H.

**Roadway Assumptions**

The model analyzed the noise impacts from the nearby roadways onto the project vicinity. All analyzed roadways were based on a single lane equivalent noise source combining both directions of travel. The study area roadway parameters have been based on the roadway classification provided in the City’s General Plan Circulation Element. The resultant traffic volumes and roadway parameters used for this study are presented in Table 3.12-11.
Table 3.12-11: SoundPlan Model Roadway Parameters

<table>
<thead>
<tr>
<th>Roadway—Segment Description</th>
<th>General Plan Classification</th>
<th>Vehicle Speed (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannon Street—North of Taft Avenue</td>
<td>Major Arterial</td>
<td>45</td>
</tr>
<tr>
<td>Cannon Street—North of Santiago Canyon Road</td>
<td>Major Arterial</td>
<td>45</td>
</tr>
<tr>
<td>Cannon Street—South of Santiago Canyon Road</td>
<td>Secondary Arterial</td>
<td>35</td>
</tr>
<tr>
<td>Orange Park Boulevard—South of Santiago Canyon Road</td>
<td>Collector</td>
<td>40</td>
</tr>
<tr>
<td>Serrano Avenue—East of Cannon Street</td>
<td>Secondary</td>
<td>40</td>
</tr>
<tr>
<td>Santiago Canyon Road—West of Cannon Street</td>
<td>Augmented Primary</td>
<td>45</td>
</tr>
<tr>
<td>Santiago Canyon Road—East of Cannon Street</td>
<td>Augmented Primary</td>
<td>50</td>
</tr>
<tr>
<td>Santiago Canyon Road—East of Orange Park Boulevard</td>
<td>Augmented Primary</td>
<td>50</td>
</tr>
<tr>
<td>Mt McKinley Boulevard/Mabury Avenue—East of Serrano Avenue</td>
<td>Local</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: FirstCarbon Solutions, 2017.

In order to determine the off-site project generated traffic noise impacts, the average daily traffic volumes on the study area local roadways were obtained from the traffic analysis prepared for this project by Linscott Law & Greenspan (December, 2017). Most of the average daily traffic (ADT) volumes were taken directly from the Traffic Analysis, however the Traffic Analysis only provided AM and PM peak hour volumes for the roadway segment of Serrano Avenue east of Cannon Street and the ADT volume for this roadway segment was calculated by multiplying the PM peak hour volumes by 10, which was the closest PM Peak to ADT multiplier available to all of the roadway segments analyzed where both the PM Peak and ADT volumes were provided. Since the Traffic Study did not provide the traffic volumes for Mount McKinley Boulevard/Mabury Avenue, the traffic volume of 1,000 ADT was estimated from field observations during the noise measurements. The model requires the separate input of autos, medium trucks, and heavy trucks. The vehicle mix was based on the vehicle mix used in the City of Orange General Plan Program Environment Impact Report for the city’s roadways.

The resultant noise levels were weighed and summed over a 24-hour period in order to determine the CNEL values. Adjustments are then made to account for the roadway active width (i.e., 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; and the site conditions (“hard” or “soft”) as they relate to the absorption of the ground, pavement, or landscaping.

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project’s potential off-site noise impacts have
been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

**Stationary Operational Noise Impacts**

The proposed project could include new stationary noise sources, such as typical parking lot activities, and new mechanical ventilation equipment. These activities are potential point sources of noise that could affect noise-sensitive receptors in the project vicinity. At the time of preparation of this analysis, details were not available pertaining to mechanical ventilation systems; therefore, a reference noise level for typical rooftop mechanical ventilation systems was used.

**Permanent Increase in Ambient Noise Levels**

The project would not result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.

As noted in the characteristics of noise discussion, audible increases in noise levels generally refer to a change of 3 dBA or more, as this level has been found to be barely perceptible to the human ear in outdoor environments. A change of 5 dBA is considered to be the minimum change considered readily perceptible to the human ear in outdoor environments. In order for proposed project’s operations to be considered significant, the proposed project would need to increase the noise levels on a residential or school land use above 65 dBA CNEL where the without project noise level is below 65 dBA CNEL, or by (1) 5 dBA CNEL where the without project noise level is less than 65 dBA CNEL, or (2) 3 dBA CNEL where the without project noise level is greater than 65 dBA CNEL. A significant impact would also occur if the proposed project provides any increase to a residential or school use receptor location which already exceeds 75 dBA CNEL.

**3.12.5 - 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?
3.12.6 - Project Impacts and Mitigation Measures

This section discusses potential impacts associated with the development of the project and provides mitigation measures where appropriate. The 129 residential parcels would occupy the 50 acres in the southern and eastern portion of the site between Santiago Creek and E. Santiago Canyon Road. Open space and recreational uses would occupy the balance of the project site. Santiago Creek and the area north of the creek would be permanently preserved as greenway. The area located south of the creek and west of the residential uses would be occupied by a community activity center that includes uses such as, but not limited to, gardens, 4-H, farmers market, and flex activities.

Noise in Excess of Adopted Standards

Impact NOI-1: The proposed project will result in 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.

Impact Analysis

Construction Noise Impacts

Implementation of the proposed project will be primarily dictated by economic conditions and may occur on a phased basis over a period of years. However, for the purposes of providing a conservative, reasonable worst-case analysis in this EIR, it will be assumed that the entire project would be developed in a single phase that takes 12 months to complete.

Two types of short-term noise impacts could occur during the construction of the proposed project. First, construction crew commutes and the transport of construction equipment and materials to the project site would incrementally increase noise levels on access roads leading to the project site. 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. Therefore, short-term construction-related impacts associated with worker commute 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 construction on the project site. Construction is completed 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 the site and, therefore, the noise levels surrounding the site as construction progresses. Despite the variety in the type and size of construction equipment, similarities in the dominant noise sources and patterns of operation allow construction related noise ranges to be categorized by work phase. Typical 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. Impact equipment such as pile drivers is not expected to be used during construction of this project.

The highest construction-related noise levels would be generated during ground clearing, excavation, and grading, as these phases require the use of the heaviest, and loudest, pieces of construction equipment. Large pieces of earth-moving equipment, such as graders, excavators, and bulldozers,
generate maximum noise levels of 80 dBA to 85 dBA $L_{\text{max}}$ at a distance of 50 feet. These noise levels drop off at a rate of about 6 dBA per doubling of distance between the noise source and receptor. As construction moves away from noise-sensitive receptors, noise levels generated by heavy construction will be lower. A characteristic of noise is that each doubling of the 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, the reasonable worst-case combined noise level during this phase of construction would be 90 dBA $L_{\text{max}}$ at a distance of 50 feet from an active construction area.

The residential uses to the east are the closest off-site sensitive receptors to where construction equipment would be operating during the site preparation for the proposed residential unit development. These homes would be located as near as 100 feet from the center of the nearest construction footprint where multiple pieces of heavy equipment could be operating simultaneously. At this distance, these loudest construction activities could be expected to result in noise levels ranging up to approximately 84 dBA $L_{\text{max}}$ intermittently when multiple pieces of heavy construction equipment operate simultaneously at the nearest center of construction activity.

Although there would be single-event noise exposure potential to cause intermittent noise nuisance from project construction activity, the effect on longer-term (hourly or daily) ambient noise levels would be small, but could result in annoyance or even sleep disturbance of nearby sensitive receptors if operating outside daytime hours. The noise ordinance of the Municipal Code limits noise producing construction activity to between the hours of 7:00 a.m. and 8:00 p.m. Monday through Saturday; these activities are not permitted on Sundays or federal holidays. Thus, compliance with the City’s permissible hours of construction, as well as compliance with best management practices, construction noise reduction measures outlined in Mitigation Measure (MM) NOI-1a, would ensure that construction noise would not result in sleep disturbance of sensitive receptors or exposure of persons to noise levels in excess of established standards. With the incorporation of mitigation, short-term construction impacts associated with applicable noise standards established by the City of Orange will be less than significant.

**Traffic Noise Impacts**

Vehicle noise is a combination of the noise produced by the engine, exhaust and tires. The level of traffic noise depends on three primary factors (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. The proposed project does not propose any uses that would require a substantial number of truck trips and the proposed project would not alter the speed limit on any existing roadway so the proposed project’s potential off-site noise impacts have been focused on the noise impacts associated with the change of volume of traffic that would occur with development of the proposed project.

The potential off-site noise impacts caused through the increase in vehicular traffic from the ongoing operations from the proposed project on to the project study area roadways have been analyzed for the following five traffic scenarios:
To quantify the traffic noise impacts along the analyzed roadways, the roadway noise contours were calculated for Existing (Exhibit 3.12-1), Existing with Project (Exhibit 3.12-2), year 2022 baseline (Exhibit 3.12-3), year 2022 with project (Exhibit 3.12-4), year 2040 baseline (Exhibit 3.12-5), and year 2040 with project (Exhibit 3.12-6) project noise contour maps.

In order for off-site roadway noise impacts created by the proposed project’s operations to be considered significant, the proposed project would need to increase the noise levels on a residential or school land use above 65 dBA CNEL where the without project noise level is below 65 dBA CNEL or by (1) 5 dBA CNEL, where the without project noise level is less than 65 dBA CNEL or (2) 3 dBA CNEL, where the without project noise level is greater than 65 dBA CNEL. A significant impact would also occur if the proposed project provides any increase to a residential or school use that already exceeds 75 dBA CNEL. The proposed project’s on-site and off-site noise impacts have been analyzed for the existing, year 2022, and year 2040 conditions, which are discussed below.
Exhibit 3-12.2
Existing With Project Noise Contour Map
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Exhibit 3-12.4
Year 2022 with Project Noise Contour Map

Source: SoundPlan Version 8.0.
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**Existing Conditions**

The proposed project’s potential off-site noise impacts have been calculated through a comparison of the existing scenario to the existing with project scenario. The results of this comparison are shown in Table 3.12-12. The SoundPlan Model printouts are provided in Appendix H.

**Table 3.12-12: Roadway Noise Impacts to Nearby Sensitive Receptors—Existing Conditions**

<table>
<thead>
<tr>
<th>Receiver</th>
<th>No Project</th>
<th>With Project</th>
<th>Increase</th>
<th>Increase Threshold</th>
<th>Exceed City Standard?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>68.3</td>
<td>68.3</td>
<td>0.0</td>
<td>+3 dBA</td>
<td>No</td>
</tr>
<tr>
<td>2</td>
<td>57.9</td>
<td>58.0</td>
<td>0.1</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>57.1</td>
<td>57.1</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>4</td>
<td>53.6</td>
<td>53.6</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>54.5</td>
<td>54.6</td>
<td>0.1</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>6</td>
<td>56.1</td>
<td>56.1</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>7</td>
<td>53.3</td>
<td>53.3</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>8</td>
<td>49.0</td>
<td>49.0</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>9</td>
<td>50.1</td>
<td>50.1</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>10</td>
<td>52.1</td>
<td>52.1</td>
<td>0.0</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>11</td>
<td>65.9</td>
<td>66.0</td>
<td>0.1</td>
<td>+3 dBA</td>
<td>No</td>
</tr>
<tr>
<td>12</td>
<td>63.9</td>
<td>64.0</td>
<td>0.1</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
<tr>
<td>13</td>
<td>65.4</td>
<td>65.5</td>
<td>0.1</td>
<td>+3 dBA</td>
<td>No</td>
</tr>
<tr>
<td>14</td>
<td>66.3</td>
<td>66.4</td>
<td>0.1</td>
<td>+3 dBA</td>
<td>No</td>
</tr>
<tr>
<td>15</td>
<td>64.4</td>
<td>64.5</td>
<td>0.1</td>
<td>+5 dBA</td>
<td>No</td>
</tr>
</tbody>
</table>

**Notes:**
- All noise levels that exceed the City’s 65 dBA CNEL residential standard shown in **Bold**
- Receiver locations shown in Exhibits 3.12-1 and 3.12-2.
- Noise level includes a 4.77 dBA penalty to account for the noise sensitive evening hours and a 10 dBA penalty to account for the noise sensitive nighttime hours.
- Increase threshold obtained from City of Orange General Plan, 2010.

Table 3.12-12 above shows that for the existing conditions, noise level contributions from the proposed project to the representative nearby sensitive receptors would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no analyzed sensitive receptors would exceed the City’s residential or school noise standard of 65 dBA CNEL when compared to existing without project conditions. In addition, no sensitive receptors would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the existing conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur at the nearby homes and schools.
Year 2022 Conditions

The proposed project’s potential off-site noise impacts have been calculated through a comparison of the year 2022 baseline scenario to the year 2022 with project scenario. The results of this comparison are shown in Table 3.12-13. The SoundPlan Model printouts are provided in Appendix H for the year 2022 baseline conditions and year 2022 with project conditions.

### Table 3.12-13: Roadway Noise Impacts to Nearby Sensitive Receptors—Year 2022 Conditions

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Year 2022 (dBA CNE1)</th>
<th>Increase</th>
<th>Increase Threshold2</th>
<th>Exceed City Standard?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Project</td>
<td>With Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>68.6</td>
<td>68.6</td>
<td>0.0</td>
<td>+3 dBA</td>
</tr>
<tr>
<td>2</td>
<td>58.2</td>
<td>58.3</td>
<td>0.1</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>3</td>
<td>57.4</td>
<td>57.5</td>
<td>0.1</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>4</td>
<td>53.9</td>
<td>53.9</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>5</td>
<td>54.7</td>
<td>54.7</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>6</td>
<td>56.3</td>
<td>56.3</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>7</td>
<td>53.4</td>
<td>53.4</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>8</td>
<td>49.1</td>
<td>49.1</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>9</td>
<td>50.3</td>
<td>50.3</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>10</td>
<td>52.4</td>
<td>52.4</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>11</td>
<td>66.3</td>
<td>66.4</td>
<td>0.1</td>
<td>+3 dBA</td>
</tr>
<tr>
<td>12</td>
<td>64.3</td>
<td>64.4</td>
<td>0.1</td>
<td>+5 dBA</td>
</tr>
<tr>
<td>13</td>
<td>65.8</td>
<td>65.9</td>
<td>0.1</td>
<td>+3 dBA</td>
</tr>
<tr>
<td>14</td>
<td>66.7</td>
<td>66.8</td>
<td>0.1</td>
<td>+3 dBA</td>
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<tr>
<td>15</td>
<td>64.8</td>
<td>64.8</td>
<td>0.0</td>
<td>+5 dBA</td>
</tr>
</tbody>
</table>

Notes:

All noise levels that exceed the City’s 65 dBA CNEL residential standard shown in **Bold**

1 Receiver locations shown in Exhibits 3.12-3 and 3.12-4.

2 Increase threshold obtained from City of Orange General Plan, 2010.


Table 3.12-13 above shows that for the year 2022 conditions, noise level contributions from the proposed project to the representative nearby sensitive receptors would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no analyzed sensitive receptors would exceed the City’s residential or school noise standard of 65 dBA CNEL when compared to existing without project conditions. In addition, no sensitive receptors would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the year 2022 conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur at the nearby homes and schools.
Year 2040 Conditions

The proposed project’s potential off-site noise impacts have been calculated through a comparison of the year 2040 baseline scenario to the year 2040 with project scenario. The results of this comparison are shown in Table 3.12-14. The SoundPlan Model printouts are provided in Appendix H for the year 2040 baseline conditions and year 2040 baseline with project conditions.

Table 3.12-14: Roadway Noise Impacts to Nearby Sensitive Receptors—Year 2040 Conditions

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Year 2040 (dBA CNEL)</th>
<th>Increase</th>
<th>Increase Threshold</th>
<th>Exceed City Standard?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Project</td>
<td>With Project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>70.1</td>
<td>70.2</td>
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<td>66.4</td>
<td>66.4</td>
<td>0.0</td>
<td>+3 dBA</td>
</tr>
</tbody>
</table>

Notes:
All noise levels that exceed the City’s 65 dBA CNEL residential standard shown in **Bold**
1 Receiver locations shown in Exhibit 5 and 6.
2 Increase threshold obtained from City of Orange General Plan, 2010.

Table 3.12-14 above shows that for the year 2040 conditions, noise level contributions from the proposed project to the representative nearby sensitive receptors would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no analyzed sensitive receptors would exceed the City’s residential or school noise standard of 65 dBA CNEL when compared to existing without project conditions. In addition, no sensitive receptors would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the year 2040 conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur at the nearby homes, churches and schools.
Potential On-site Exterior Traffic Noise Impacts

The proposed residential, community center and open space uses may be exposed to noise levels in excess of City standards. According to the City's General Plan, noise levels at new residential uses shall be limited to 65 dBA CNEL for exterior living areas and 45 dBA CNEL for interior living areas. In addition, exterior noise levels at neighborhood centers and parks shall be limited to 70 dBA CNEL.

To evaluate the noise exposure levels that would impact the proposed residential and community uses along East Santiago Canyon Road, the year 2040 with project scenario was utilized for calculating the exterior noise impacts at those proposed uses. As shown in Exhibit 3.12-6, the 65 dBA and 70 dBA CNEL traffic noise level contour extend 352 feet and 163 feet onto the project site, respectively. A detailed site plan has yet to be drafted, however, for this analysis it is assumed that residential uses would be located within 163 feet of East Santiago Canyon Road. Therefore, all residential structures within 352 feet of the centerline of East Santiago Canyon Road would be exposed to traffic noise levels in excess of the City’s “normally compatible” standard of 65 dBA CNEL for new single-family residential land use development. Therefore, mitigation must be incorporated into the Project to reduce on-site traffic noise impacts.

It should be noted that existing noise sensitive residential uses located along East Santiago Canyon Road to the east and south of the project site are immediately adjacent the four-lane roadway. These noise sensitive receptors are shielded from East Santiago Canyon Road traffic noise by a 6-foot noise barrier. This 6-foot noise barrier was accounted for in SoundPlan modeling and Exhibit 3.12-6 shows that noise levels at these existing noise sensitive residences are below 65 dBA CNEL within backyard areas.

Potential On-site Interior Traffic Noise Impacts

According to the City’s land use compatibility standards, when new residential development is proposed in areas with a noise environment ranging from 65 dBA to 70 dBA CNEL, a detailed noise impact analysis must be performed and needed noise insulation features must be included in the design to ensure that the interior noise standard of 45 dBA CNEL is maintained. This requirement is also consistent with General Plan Policy 1.6.

Based on the EPA’s Protective Noise Levels (EPA 550/9-79-100, November 1978), with a combination of walls, doors and windows, standard construction for northern California residential buildings would provide approximately 25 dBA in exterior to interior noise reduction with windows closed, and approximately 15 dBA with windows open. These exterior to interior noise reduction rates are also consistent with the exterior to interior noise reduction rates provided in Table N-5 from the General Plan (City of Orange, 2010).

Beyond approximately 560 feet from the centerline of East Santiago Canyon Road, exterior traffic noise levels would attenuate to below 60 dBA CNEL, and therefore, interior noise levels would attenuate to the interior residential living space noise level standard of 45 dBA CNEL (65 dBA-15 dBA = 45 dBA). In other words, beyond 560 feet from the center line of East Santiago Canyon Road, standard residential construction methods would provide sufficient reduction to meet the interior residential living space noise level standard of 45 dBA CNEL.
However, with windows open, interior living spaces for the proposed residential land uses located within approximately 560 feet of the center line of East Santiago Canyon Road would not meet the interior noise standard of 45 dBA CNEL (60+ dBA–15 dBA = 45+ dBA). With windows closed, the interior noise standard would be met for the area between 164 and 560 feet from the centerline of East Santiago Canyon Road (60 to 70 dBA–25 dBA = 35 to 45 dBA). In such cases, it is standard procedure to require that an alternative ventilation system, such as air conditioning, be provided to ensure that windows can remain closed for a prolonged period of time in order to meet interior noise standards. Although detailed design plans are not available at this time, it is assumed for this climate that all proposed residences would include, as a project design feature, a heating/air conditioning ventilation system (HVAC) that would allow for a windows closed condition. For any homes located closer than 164 feet from the centerline of East Santiago Canyon Road, additional mitigation is required to meet the interior noise standard, which could be achieved through the use of upgraded windows and doors.

**Off-site Stationary Noise Impacts**

On the southeastern area of the project site, 129 single-family residences are proposed for construction within the Residential Development Area. This residential portion of the Project would include new stationary noise sources such as new mechanical ventilation system equipment on the outside of the proposed residential units. In order for operational stationary noise impacts created by the proposed project to be considered significant, the project-related operational noise level would have to exceed 55 dBA L_{eq} and 70 dBA L_{max} between 7:00 a.m. and 10:00 p.m. or exceed 50 dBA L_{eq} and 65 dBA L_{max} between 10:00 p.m. and 7:00 p.m. at the exterior façade of nearby sensitive receptors.

Typical new residential mechanical ventilation systems (such as exterior air conditioning units) generate noise levels from approximately 50 dBA to 65 dBA L_{eq} at 10 feet (Noise Navigator™ Sound Level Database 2015). The residential uses to the east are the closest off-site sensitive receptors, and are located approximately 65 feet from the Project’s nearest property line. At this distance, these noise levels would attenuate to 49 dBA L_{eq}. Therefore, noise levels from mechanical ventilation systems operations would not exceed the City’s standard of 55 dBA L_{eq} and 70 dBA L_{max} between 7:00 a.m. and 10:00 p.m. or exceed 50 dBA L_{eq} and 65 dBA L_{max} between 10:00 p.m. and 7:00 p.m. at the exterior façade of nearby sensitive receptors.

The area located south of the creek and west of the proposed residential uses would be occupied by recreational uses. These land uses/improvements could result in new stationary noise sources primarily associated with the activities at the parking lot and related to community activities. Parking lot activities, such as people conversing or doors slamming, typically generate noise levels of approximately 60 dBA to 70 dBA L_{max} at 50 feet and would most likely be located along East Santiago Canyon Road. The nearest off-site sensitive receptors to a potential parking lot would be the residential land uses located approximately 125 feet to south across the four lane East Santiago Canyon Road. Noise levels from these parking lot activities at this distance could range up to approximately 62 dBA L_{max}. Therefore, when averaged over a 24-hour period, noise levels from community center activities would not exceed the City’s standard of 55 dBA L_{eq} and 70 dBA L_{max} between 7:00 a.m. and 10:00 p.m. or exceed 50 dBA L_{eq} and 65 dBA L_{max} between 10:00 p.m. and 7:00 p.m. at the exterior façade of nearby sensitive receptors.
Potentially significant impacts could occur if parking lot activities exceeded existing maximum noise levels in the Project vicinity. However, maximum noise levels along East Santiago Canyon Road and in the Project vicinity exceed 70 dBA $L_{\text{max}}$ and there is an existing noise barrier located along noise sensitive residential property lines south of East Santiago Canyon Road. In addition, although there could be occasional single-event noise exposure of over 70 dBA $L_{\text{max}}$ from parking lot activities as measured at 50 feet, these single-event maximum noise levels are not expected to occur for more than a cumulative 1 minute within any hour. Therefore, when averaged over a 24-hour period, noise levels from parking lot activities would not exceed the City’s standard of 55 dBA $L_{\text{eq}}$ and 70 dBA $L_{\text{max}}$ between 7:00 a.m. and 10:00 p.m. or exceed 50 dBA $L_{\text{eq}}$ and 65 dBA $L_{\text{max}}$ between 10:00 p.m. and 7:00 p.m. at the exterior façade of nearby sensitive receptors. As a result, Project-related parking lot activities would not result in exposure of persons to noise levels in excess of existing noise levels nor result in noise levels that would exceed established standards.

Noise sources associated with recreational activities would primarily be comprised of human speech. There could be periods of intensive activity prior to a farmers market with setup and tear down activities. Activities associated with recreational uses would not require the use of heavy noise producing equipment. The nearest noise-sensitive residential uses to the proposed recreational uses are those located to the north over 300 feet away. The residential uses to the south benefit from an existing noise barrier and recreational activities would be dominated by East Santiago Canyon Road traffic noise. Therefore, when averaged over a 24-hour period, noise levels from community center activities would not exceed the City’s standard of 55 dBA $L_{\text{eq}}$ and 70 dBA $L_{\text{max}}$ between 7:00 a.m. and 10:00 p.m. or exceed 50 dBA $L_{\text{eq}}$ and 65 dBA $L_{\text{max}}$ between 10:00 p.m. and 7:00 p.m. at the exterior façade of nearby sensitive receptors. As a result, project-related parking lot activities would not result in exposure of persons to noise levels in excess of existing noise levels nor result in noise levels that would exceed established standards.

In summary, on-site stationary operational noise levels would not exceed existing ambient noise levels in the Project vicinity nor be expected to exceed the City’s maximum allowable noise exposure standards for receiving land uses. Related impacts would be less than significant.

**Level of Significance Before Mitigation**

Potentially significant impact.

**Mitigation Measures**

**MM NOI-1a**

To reduce potential construction noise impacts, the following multi-part mitigation measure shall be implemented for the proposed project:

- 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 locate stationary noise-generating equipment as far as possible from sensitive receptors when sensitive receptors adjoin or are near a construction project area. In addition, the project contractor shall place such stationary construction equipment so that emitted noise is directed away from sensitive receptors nearest the project site.
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.

The construction contractor shall, to the maximum extent practical, locate on-site equipment staging areas to maximize the distance between construction-related noise sources and noise-sensitive receptors nearest the project site during all project construction.

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 designate a noise disturbance coordinator who would be responsible for responding to any local complaints about construction noise. The disturbance coordinator would determine the cause of the noise complaints (starting too early, bad muffler, etc.) and establishment reasonable measures necessary to correct the problem. The construction contractor shall visibly post a telephone number for the disturbance coordinator at the construction site.

All on-site construction activities, including deliveries and engine warm-up, shall be restricted to the hours between 7:00 a.m. and 8:00 p.m. Monday through Saturday. Construction, except emergency work, shall not be permitted on Sunday or federal holidays.

To reduce potential future on-site exterior traffic noise impacts at on-site receptors adjacent to East Santiago Canyon Road, the following multi-part mitigation measure shall be implemented for the proposed project:

- Based on SoundPlan model runs, a 6-foot high noise barrier, relative to the receptor elevation, is required to comply with the City’s exterior noise standard for proposed residential uses located adjacent to Santiago Canyon Road. The calculated noise contours are shown in Exhibit 3.12-7. In order to meet the City’s exterior noise standard for community uses, a 4-foot high berm would be required along Santiago Canyon Road; or
- A minimum setback distance of 164 feet from the centerline of East Santiago Canyon Road shall be incorporated into the design feature. The first row of residential uses constructed 164 feet from the centerline will also have front yards facing East Santiago Canyon Road.

To reduce potential future on-site interior traffic noise impacts at on-site receptors adjacent to East Santiago Canyon Road, the following multi-part mitigation measure shall be implemented for the proposed project:

- All proposed residential units located within 560 feet of the centerline of East Santiago Canyon Road shall include an alternate form of ventilation, such as an air conditioning system, in order to ensure that windows can remain closed for a
prolonged period of time. The building plans approved by the County shall reflect this requirement.

- All second story habitable rooms of proposed residential units located within 164 feet of the centerline of East Santiago Canyon Road shall include STC 30 rated windows in facades that would be parallel and perpendicular to East Santiago Canyon Road; or,

- Upon completion of the architectural plans, a detailed acoustical study shall be prepared by a qualified noise analyst that analyzes the interior noise levels of the proposed residential units and provides design features to reduce the interior noise levels to within the 45 dBA CNEL standard.

**Level of Significance After Mitigation**

Less than significant impact.

**Vibration**

| Impact NOI-2: | The project would not expose persons to or generation of excessive groundborne vibration or groundborne noise levels. |

**Impact Analysis**

**Construction-Related Vibration**

Construction activities can produce vibration that may be felt by adjacent uses. The primary sources of vibration during construction would be during grading activities. The closest vibration sensitive land uses are the nearby single-family homes, with the nearest residential structures located approximately 50 east feet from the proposed area to be graded. It is anticipated that the vibration levels caused by a vibratory roller operating on the edge of the area to be graded during construction of the proposed project at the nearest structure will be around 0.098 PPV would be readily perceptible for a person sitting or lying down and may create groundborne noise such as the rattling of loose windows or dishes. However, the vibration impacts would only occur when heavy construction equipment is operating in the immediate vicinity of a sensitive receptor, which would only occur intermittently for a limited duration. In addition, this vibration level is below the 0.2 PPV FTA threshold. Therefore, the short-term construction-related vibration from the proposed project would result in a less than significant short-term vibration impact.

**Operational-Related Vibration Impacts**

Residential units could be located as near as 50 feet from the edge of East Santiago Canyon Road. According to Table 4.12-1, Vibration Source Levels for Construction Equipment, a truck typically produces a vibration level of 0.076 inch per second PPV at 25 feet from a roadway. Based on the typical propagation of vibration this would result in reasonable worst-case vibration level of 0.035 inch per second PPV at the nearest proposed residential unit to East Santiago Canyon Road. A vibration level of 0.035 inch per second PPV would be slightly above the level of perception for a person sitting or lying down and may create groundborne noise such as the rattling of loose windows or dishes, if East Santiago Canyon Road is not properly maintained in the future. This vibration level is below the 0.2 PPV FTA threshold. Therefore, a less than significant vibration impact is anticipated from the on-going operations of the proposed project.
Year 2040 With Project Sound Walls/Berms Noise Contour Map

Exhibit 3-12.7
Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is necessary.

Level of Significance After Mitigation
Less than significant impact.

Permanent Increase in Ambient Noise Levels

| Impact NOI-3: | The proposed project would not result in a substantial permanent increase in ambient noise levels in the project vicinity. |

Impact Analysis

Potential Off-Site Road Noise Impacts
In order for off-site roadway noise impacts created by the proposed project’s operations to be considered significant, the proposed project would need to increase the noise levels on a residential or school land use above 65 dBA CNEL where the without project noise level is below 65 dBA CNEL, or by (1) 5 dBA CNEL where the without project noise level is less than 65 dBA CNEL, or (2) 3 dBA CNEL where the without project noise level is greater than 65 dBA CNEL. A significant impact would also occur if the proposed project provides any increase to a residential or school use that already exceeds 75 dBA CNEL. The proposed project’s on-site and off-site noise impacts have been analyzed for the existing, year 2022, and 2040 conditions, which are discussed below.

Existing Conditions
The analysis in Impact NOI-1 found that for the existing conditions, noise level contributions from the proposed project to the study area roadways would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no additional roadway segments would exceed the City’s residential or school noise standard of 65 dBA CNEL when compared to existing without project conditions. In addition, no roadways would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the existing plus project conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur along the study area roadways segments.

Year 2022 Conditions
The analysis in Impact NOI-1 found that for the year 2022 conditions, noise level contributions from the proposed project to the study area roadways would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no additional roadway segments would exceed the City’s residential or school noise standard of 65 dBA CNEL when compared to year 2022 baseline conditions. In addition, no roadways would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the year 2022 plus project conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur along the study area roadways segments.
Year 2040 Conditions
The analysis in Impact NOI-1 found that for the year 2040 conditions, noise level contributions from the proposed project to the study area roadways would range from 0.0 to 0.1 dBA CNEL, which is below the 5 dBA increase threshold for roadways below 65 dBA CNEL and below the 3 dBA increase threshold for roadways that exceed 65 dBA CNEL. In this scenario, no additional roadway segments would exceed the City's residential or school noise standard of 65 dBA CNEL when compared to year 2040 baseline conditions. In addition, no roadways would exceed the 75 dBA CNEL maximum noise exposure level. Therefore, for the year 2040 plus project conditions, no significant long-term off-site noise impacts from project-related vehicle noise would occur along the study area roadways segments.

Potential Stationary Noise Impacts
The analysis in Impact NOI-1 found that for the most noise intensive use proposed, the stationary noise levels at the nearby sensitive receptors would be below the City’s 55 dBA $L_{eq}$ daytime and 50 dBA $L_{eq}$ nighttime exterior stationary noise standards. Therefore, a less than significant stationary average noise impact would occur from the ongoing operations of the proposed project at the nearby sensitive receptors.

Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is necessary.

Level of Significance After Mitigation
Less than significant impact.

Temporary Increase in Ambient Noise Levels

Impact NOI-4: The proposed project will result in a substantial temporary increase in ambient noise levels in the project vicinity.

Impact Analysis
The proposed project would not create a substantial temporary or periodic increase in ambient noise levels in the proposed project vicinity above noise levels existing without the proposed project.

The analysis in Impact NOI-1 found that, although there would be single-event noise exposure potential to cause intermittent noise nuisance from project construction activity, the effect on longer-term (hourly or daily) ambient noise levels would be small, but could result in annoyance or even sleep disturbance of nearby sensitive receptors if operating outside daytime hours. Therefore, compliance with the City’s permissible hours of construction, as well as compliance with best management practices, construction noise reduction measures outlined in Mitigation Measure NOI-1a, would ensure that construction noise would not result in sleep disturbance of sensitive receptors or result in a substantial temporary increase in ambient noise levels as measured at nearby sensitive receptors.
**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**
Implement Mitigation Measure NOI-1a.

**Level of Significance After Mitigation**
Less than significant impact.
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3.13 - Population and Housing

This section describes population and housing and potential effects from project implementation on the affected area and its surroundings. Descriptions and analysis in this section are based on population and housing information provided by the California Department of Finance and the City of Orange.

3.13.1 - Existing Conditions

Current Population and Housing Characteristics

The City of Orange’s population was estimated to be 141,240 as of January 1, 2016 by the California Department of Finance. Table 3.13-1 summarizes the current population and housing characteristics of the City of Orange.

Table 3.13-1: City of Orange Population and Housing Summary (2016)

<table>
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<tr>
<th>Population</th>
<th>Housing Units</th>
<th>Persons Per Household</th>
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<tr>
<td>141,240</td>
<td>45,272</td>
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</table>

Source: California Department of Finance, 2016.

Historic Population Growth

The City of Orange’s population growth has increased by 63,497 persons during the 45 years between 1970 and 2015. Table 3.13-2 summarizes the population growth that occurred between 1970 and 2015.


<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Change from Previous</th>
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<td>1970</td>
<td>77,365</td>
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<td>1975</td>
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<td>7.4%</td>
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</tr>
<tr>
<td>2015</td>
<td>140,862</td>
<td>3.3%</td>
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</table>

Source: California Department of Finance, 2016.
3.13.2 - Methodology
Impacts on population and housing were assessed by reviewing existing and anticipated population and housing figures provided by the California Department of Finance and the City of Orange General Plan. The proposed project’s impacts were evaluated by determining their consistency with these estimates and projections.

3.13.3 - Thresholds of Significance
According to the CEQA Guidelines’ Appendix G Environmental Checklist, to determine whether impacts to population and housing are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

   a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

   b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? (Refer to Section 7, Effects Found Not To Be Significant.)

   c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? (Refer to Section 7, Effects Found Not To Be Significant.)

3.13.4 - Project Impacts and Mitigation Measures
This section discusses potential impacts associated with the proposed project and provides mitigation measures where necessary.

Growth Inducement

Impact POP-1: The project would not induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure).

Impact Analysis

CEQA Guidelines Section 15126.2(d) requires that an EIR discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The CEQA Guidelines provide the example of a major expansion of a wastewater treatment plant that may allow for more construction within the service area. The CEQA Guidelines also note that the evaluation of growth inducement should consider the characteristics of a project that may encourage or facilitate other activities that could significantly affect the environment.

The proposed project would develop 129 dwelling units and, therefore, has the potential to directly induce population growth. Table 3.13-3 summarizes the population growth attributable to the proposed project.
Table 3.13-3: Population Growth

<table>
<thead>
<tr>
<th>Dwelling Units</th>
<th>Persons Per Dwelling Unit</th>
<th>Project Population</th>
<th>City of Orange’s Population</th>
<th>Project Population Growth as a Percentage of City Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>3.07</td>
<td>396</td>
<td>141,420</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Source: FCS, 2016

As shown in Table 3.13-3, the proposed project would increase the City’s population by 396 persons, which would represent a less than 1 percent increase relative to the City’s 2016 population estimate of 141,420. This would not be considered a significant population increase.

Furthermore, a portion of the project site is currently designated for residential use by the City of Orange General Plan and Orange Zoning Ordinance. This indicates that the project site has been contemplated to support residential development and, by extension, future population growth. Although the proposed project would include a General Plan Amendment and Rezone to change the land use designations, these changes would merely serve to allow for the master planning of the site to allow a combination of residential, open space, and recreational uses. Thus, the project site would continue to be designated for residential development.

Lastly, the project site is within an urbanized portion of the City of Orange where infrastructure and utilities including roadways, potable water, sewer, electricity, and natural gas are currently available. Thus, the development of the proposed project would not remove a physical barrier to growth that would allow for unplanned growth to occur.

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.
3.14 - Public Services

3.14.1 - Introduction

This section describes the existing public services and potential effects from project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based in part on information provided by the City of Orange General Plan, City of Orange Fire Department, City of Orange Police Department, City of Orange Public Works, and the Orange Unified School District (OUSD). Written comments from service providers are provided in Appendix I.

3.14.2 - Environmental Setting

Fire Protection and Emergency Medical Services

The project site is located in an area served by the City of Orange Fire Department. The City of Orange Fire Department provides the City with full fire protection services and emergency medical service (EMS). The Fire Department is headquartered at 176 S. Grand Street, Orange, California.

Fire Stations

The Orange Fire Department emergency responders work out of eight fire stations strategically located throughout the City. The closest fire station to the project site is Orange Fire Station No. 8, located approximately 1.75 miles north of the project site at 5725 Carver Lane; there is also an Orange County Fire Authority Fire Station, 23, approximately 0.64 mile east of the project site at 5020 Santiago Canyon Road, Villa Park, CA 92869 (Table 3.14-1).

<table>
<thead>
<tr>
<th>Station No.</th>
<th>Address</th>
<th>Distance From Project Site</th>
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<tbody>
<tr>
<td>Orange Fire Department Station No. 8</td>
<td>5725 Carver Lane</td>
<td>1.75 miles</td>
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<tr>
<td>Orange County Fire Authority Station 23</td>
<td>5020 Santiago Canyon Road</td>
<td>0.64 mile</td>
</tr>
<tr>
<td></td>
<td>Villa Park, CA 92869</td>
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</tbody>
</table>

Source: City of Orange, 2016.

Staffing and Organization

The Orange Fire Department consists of two sections: Services and Operations. The department provides emergency response, administrative, fire prevention, disaster preparedness, and arson investigation services. The Orange Fire Department employs approximately 137 personnel, including 124 sworn emergency responders.

The Orange Fire Department provides fire paramedic and ambulance service with an integrated paramedic/transportation system. This system uses front line engine, truck, and rescue ambulance companies to provide these emergency medical services. Every fire station houses at least one “paramedic assessment unit” (PAU) that is normally staffed with at least one paramedic. PAUs are normally in the form of an engine company. PAUs are at every station to achieve the goal of an
initial on-scene time for EMS intervention of less than 6 minutes. Then, the rescue ambulances located at Stations 1, 3, 4, and 5 arrive to complete a paramedic team.

The Orange Fire Department Headquarters at 176 South Grand Street, approximately 3.83 miles southwest of the project site, houses the Urban Search and Rescue Emergency Operation.

**Calls for Service**

In 2016, the Orange Fire Department responded to approximately 15,048 incidents, of which 80 percent (12,048 calls) were medical in nature. This reflects a call load virtually equal to 2015, in which the Fire Department responded to 15,090 incidents. Station No. 8 responded to 631 incidents in 2016.

**Response Time**

The Orange Fire Department’s average response time was 3 minutes, 45 seconds in 2016.

**Mutual Aid**

The Orange Fire Department has automatic aid agreements with the cities of Anaheim, Santa Ana, Garden Grove and the Orange County Fire Authority.

As noted above, the Orange County Fire Authority Station 23 is located 0.64 mile west the project site. In 2016, the Orange County Fire Authority responded to approximately 136,934 incidents, of which 76 percent (104,153) were medical in nature. The Orange County Fire Authority’s average response time was less than 7 minutes in 2016.

**Law Enforcement**

The Orange Police Department provides law enforcement to the City of Orange. The Police Department is headquartered at 1107 N. Batavia Street, which is approximately 4.6 miles west of the project site. The Police Department also maintains substations in Santiago Canyon and at the Outlets at Orange. The City of Orange is divided into 97 police reporting districts. The project is within police reporting district No. 94 with boundaries of Santiago Canyon Road and the Santiago Creek.

**Operation**

The Police Department has 167 sworn police officers, 60 full-time civilian support staff and 15 reserve officers. The response area is approximately 27 square miles with future expansion of up to 55 square files.

The Police Department does not use a standard officer-to-population or standard response time objective ratio to measure the adequacy of policing levels in the City of Orange. Instead, the Police Department analyzes demographics, service calls, population, crime trends and other changing factors to determine the level of police services needed.
**Response Times**

Emergency response times vary on average from 4 to 7 minutes, depending on other call priorities and location of police vehicles in relation to call location. The call response time accounts for the department’s policy requiring that two officers be available before responding to an emergency call. Each new development has a potential impact on response times and increased demand on police services. Using design mitigations and adding security measures could help reduce the number of times the Police Department responds to the project area.

**Schools**

The Orange Unified School District (OUSD) provides K-12 public school services to the City of Orange as well as portions of neighboring cities of Anaheim, Garden Grove, Santa Ana, and Villa Park. OUSD serves over 31,300 students with 29 elementary schools; five middle schools (two of which are charter schools), two high schools, a continuation high school, a K-8 math and science magnet school, and two special schools.

Linda Vista Elementary School, Santiago Middle School, and El Modena High School are the closest schools to the project site and are summarized in Table 3.14-2.

<table>
<thead>
<tr>
<th>School</th>
<th>Address</th>
<th>Enrollment</th>
<th>Average Class Size</th>
<th>Pupil/Teacher Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linda Vista Elementary School</td>
<td>1200 N. Cannon Street</td>
<td>486</td>
<td>29.4</td>
<td>22.0</td>
</tr>
<tr>
<td>Santiago Middle School</td>
<td>515 North Rancho Santiago Boulevard</td>
<td>967</td>
<td>28.4</td>
<td>22.0</td>
</tr>
<tr>
<td>El Modena High School</td>
<td>3920 Spring Street</td>
<td>2,169</td>
<td>24.7</td>
<td>20.1</td>
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</tbody>
</table>


**Parks**

The City of Orange owns and currently maintains 24 parks, which consist of approximately 251 acres of parkland. The following three types of park facilities are available for recreational use by the City’s residents and could be subject to impact from increased demand for recreational use as the City’s population increases:

- **Neighborhood Parks** (4 to 10 acres with a 0.5- to 1-mile radius service area) provide for the daily recreation needs of residents in the immediate area. Olive Park, El Modena Park, and Killefer Park are typical examples of the City’s neighborhood parks, which may include landscaped picnic areas, tot lots, hard court areas, multipurpose ball fields, and limited parking.

- **Community Parks** (15 to 40 acres with 1- to 2-mile radius service area) are larger in scale and provide a greater variety of recreational opportunities and facilities. Hart Park, Grijalva Park, and El Camino Real Park are typical examples of the City’s community parks, which host active...
organized sports leagues, have lighted sports fields, may provide recreational instruction, and have sufficient area for larger community events.

- Regional Parks are typically 200 acres or larger and provide a greater diversity of recreational activities that cannot be fully met by neighborhood or community parks. For Orange residents, the three county regional parks that serve these needs are Irvine Park, Peters Canyon Park, and Santiago Oaks Park.

In addition to these three types of parks that provide opportunity for active recreation, the City also maintains Special Use Facilities that provide passive uses and historic or aesthetic amenities. These facilities include historic community assets such as Plaza Park, Pitcher Park, and Depot Park. The City’s community gardens and senior center also provide specialized activities.

**Library**

The Orange Public Library & Historic Center (Main Library) is located at 407 E. Chapman Avenue. The library closed in May 2005 for major construction and expansion, and was reopened in April 2007. The expansion added 28,000 square feet of space and now provides twice as many books, a homework center, a Teen Zone, a Children’s Library, a literacy center, a local history room, a Friends of the Orange Public Library bookstore, community meeting space, study room space, and 100 public-use computers.

Two branch libraries also serve the planning area. The El Modena Branch Library is located at 380 S. Hewes Street and the Taft Branch Library is located at 740 E. Taft Avenue. Each library is operated as a community resource and gathering place to provide library materials, computer access, meeting room space, and family programs to serve residents within the area.

**3.14.3 - Regulatory Framework**

**Federal and State**

*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.

**Senate Bill 50**

Senate Bill (SB) 50 (funded by Proposition 1A, approved in 1998) limits the power of cities and counties to require mitigation of school facilities impacts as a condition of approving new development, and provides instead for a standardized developer fee. SB 50 generally provides for a 50/50 state and local school facilities funding match. SB 50 also provides for three levels of statutory impact fees. The application level depends on whether state funding is available, whether the school district is eligible for state funding, and whether the school district meets certain additional criteria involving bonding capacity, year-round school, and the percentage of moveable classrooms in use.
California Government Code, Section 65995(b) and Education Code, Section 17620

SB 50 amended Section 65995 of the California Government Code, which contains limitations on Section 17620 of the Education Code, the statute that authorizes school districts to assess development fees within school district boundaries. Section 65995(b)(3) of the Government Code requires the maximum square footage assessment for development to be increased every 2 years, according to inflation adjustments. On January 22, 2014, the State approved increasing the allowable amount of statutory school facilities fees (Level I School Fees) from $3.20 to $3.36 per square foot of assessable space for residential development of 500 square feet or more, and from $0.51 to $0.54 per square foot of chargeable covered and enclosed space for commercial/industrial development. School districts may levy higher fees if they apply to the State and meet certain conditions.

Quimby Act

The Quimby Act (Government Code Section 66477) allows local governments to require developers to dedicate land, donate conservation easements, or pay fees to fund parkland development. The Quimby Act has a standard of 3.5 acres of parkland per 1,000 residents.

Local

City of Orange

The City of Orange General Plan sets forth the following goals and policies that are relevant to public services:

Land Use Element

- **Goal 1:** Meet the present and future needs of all residential and business sectors with a diverse and balanced mix of land uses.
- **Policy 1.7:** Provide a range of open space and park amenities to meet the diverse needs of current and new residents.
- **Goal 6.0:** Advance development activity that is mutually beneficial to both the environment and the community.
- **Policy 6.3:** Establish and maintain greenways, and pedestrian and bicycle connections that complement the residential, commercial and open space areas they connect.
- **Policy 6.4:** Create and maintain open space resources that provide recreational opportunities, protect hillside vistas and ridgelines, and conserve natural resources.
- **Policy 7.1:** Coordinate with the Orange Unified School District and Community College District regarding future plans for their facilities.

Public Safety Element

- **Goal 3.0:** Protect lives and property of Orange residents and businesses from urban and wildlife fire hazards.
- **Policy 3.1:** Continue to identify and evaluate new potential fire hazards and fire hazard areas.
- **Policy 3.4:** Provide adequate fire equipment access and fire suppression resources to all developed and open space areas.
- **Policy 3.5:** Establish and maintain optimal emergency response times for fire safety. Require new development to ensure that City response times and service standards are maintained.
- **Goal 6.0:** Provide public safety services of the highest quality.
• **Policy 6.1**: Provide the Police Department with adequate personnel, equipment and state-of-the-art technology to effectively combat crime, meet existing and projected service demands, and provide crime prevention programs. These resources should be provided prior to anticipated needs.

• **Policy 6.2**: Provide resources for additional police services as needed to maintain average response times.

• **Policy 6.4**: Continue to support, develop, and implement programs which improve the City's approach to fighting crime.

• **Goal 7.0**: Improve community safety and reduce opportunities for criminal activity.

• **Policy 7.1**: Provide crime prevention, community service, and education programs designed to prevent crime.

• **Policy 7.2**: Promote and integrate crime-preventive characteristics and design features into all phases of the planning and development process.

• **Policy 7.3**: Maximize natural surveillance through physical design features, including but not limited to, visible entryways from surrounding structures and businesses: well-defined and visible walkways and gates: well-lighted driveways, walkways, and exteriors: and landscaping that preserves or enhances visibility.

• **Policy 7.4**: Ensure that community areas and amenities such as transit stops, sidewalks, plazas, parks, trails, and bike paths are appropriately lighted, free of hiding places, and frequently patrolled.

• **Policy 7.5**: Maximize security of public places, recreation facilities, and new development by encouraging complementary uses that support a safe environment.

• **Policy 7.6**: Continue to involve the Orange Police Department in the project design and review process.

### 3.14.4 - Methodology

FCS reviewed information about public service and recreation providers in the project vicinity. The City of Orange General Plan and agency websites were reviewed for relevant information. FCS sent letters to service providers requesting information about their ability to serve the proposed project. The responses are provided in Appendix I.

### 3.14.5 - Thresholds of Significance

**Public Services**

According to the CEQA Guidelines’ Appendix G Environmental Checklist, to determine whether environmental effects to public services are significant, the following questions are analyzed and evaluated:

Would the project 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?

3.14.6 - Project Impacts and Mitigation Measures

Fire Protection

Impact PS-1: The proposed project may result in a need for new or expanded fire protection facilities.

Impact Analysis

The City of Orange Fire Department would serve the project with fire protection and emergency medical services. The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population.

The nearest fire station to the project site is Orange Fire Station No. 8, located 1.75 miles from the project site at 5725 Carver Lane. Using an average travel speed of 25 miles per hour, it would take a fire engine responding from Station No. 8 to the project site 4 minutes, 12 seconds. For comparison purposes, the Fire Department’s average response time was 3 minutes, 45 seconds in 2016.

The Fire Department provided written comments (Appendix I) in May 2017 indicating that the proposed project would cause a substantial increase in calls for service relative to the existing sand and gravel operations on the project site. The Fire Department noted that the call volume for the project area was low, and, thus, Station No. 8 would be able to handle the increase in calls attributable to the proposed project with its existing resources.

However, the Fire Department noted the status of Orange County Fire Authority Station No. 23, which serves the City of Villa Park, was uncertain, and there is the possibility that Villa Park may elect to contract with the City of Orange for fire services, which would increase the number of calls for service from Station No. 8. At the time of this writing, Orange County Fire Authority Station No. 23 is still open and serving Villa Park; thus, it would be speculative to engage in further discussion of this topic.

The proposed project would take vehicular access from E. Santiago Canyon Road via a full-access signalized driveway aligned with Nicky Way. The Fire Department noted that the project would be required to provide two points of emergency access in accordance with Fire Code requirements. Mitigation Measure HAZ-5 requires the applicant to demonstrate compliance with all Fire Code emergency access requirements prior to issuance of building permits.

The eastern portion of the project site abuts Santiago Oak Regional Park and contains the wooded Santiago Creek Corridor. The Fire Department noted that the project site is located at the wildland/urban interface and indicated that the project would be subject to the City’s fuel modification requirements. The project proposes to strategically place approximately 69 acres of open space/grasslands and greenway with managed vegetation within the western, northern, and eastern portions of the project site, to provide sufficient protection from wildland fires, and alleviate
related impacts. However, Mitigation Measure HAZ-6 will be applied to require the applicant to prepare a Fuel Modification Plan and submit it to the City of Orange for review and approval prior to issuance of building permits, consistent with the Fire Department’s recommendation.

With the implementation of mitigation, the project would not directly create a need to construct new or expand existing fire protection or emergency medical services facilities. Impacts would be less than significant.

**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**
Implement Mitigation Measures HAZ-5 and HAZ-6.

**Level of Significance After Mitigation**
Less than significant impact.

**Law Enforcement**

**Impact PS-2:** The proposed project would not result in a need for new or expanded police protection facilities.

**Impact Analysis**
The City of Orange Police Department would provide law enforcement services to the project site. The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population. This nominal increase in population would be expected to result in a minor increase in calls for law enforcement services.

The project site is located approximately 4.6 miles from Police Department headquarters; however, police officers continuously patrol the city limits 24 hours per day, 7 days per week and would likely be able to respond from closer distances.

The Police Department provided written comments (Appendix I) in June 2017 indicating that construction sites can be sources of attractive nuisances, providing hazards, and inviting theft and vandalism. The Police Department noted that the project applicant would be required to employ construction security features, as set forth in Orange Municipal Code Chapter 15.52.110, including fencing, lighting, and other features that would secure the project site during construction, to reduce the likelihood of criminal activity.

The Police Department also noted that although the project could increase demand for additional police service; payment of the Police Facility Development Fee in accordance with Orange Municipal Code Section 3.13.020 would offset the increase attributable to the proposed project.

Lastly, the Police Department noted that the proposed project can minimize demand for police services by incorporating Crime Prevention through Environmental Design (CPTED) concepts into the proposed project. This involves considerations such as placement and orientation of structures;
access and visibility of common areas; and placement of doors, windows, addressing, and landscaping. Orange Municipal Code Chapter 15.52 requires CPTED design requirements and Building Security Standards to be incorporated into new projects. In summary, the proposed project would be required to comply with various Municipal Code requirements that pertain to security and safety and, therefore, the project would not create a need to construct new or expand existing police protection. 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 proposed project would not result in a need for new or expanded school facilities. |

**Impact Analysis**

The Orange Unified School District would provide K-12 education to the proposed project. The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population. Using a standard student generation rate of 0.5 student/dwelling unit, the proposed project would add 75 new students to the School District’s enrollment.

The school district assesses development fees to new residential projects to fund capital improvements to school facilities. Pursuant to Government Code Section 65995, payment of adopted development fees is the “full and complete mitigation” for impacts to school facilities and local governments are prohibited from assessing additional fees or exactions for school impacts. Accordingly, the applicant will pay the current fees at the time building permits are sought.

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.
Parks

Impact PS-4: The project would not result in a need for new or expanded park facilities.

Impact Analysis

The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population. The population growth facilitated by the project would increase demand for parks.

The proposed project would provide 69 acres of open space and recreation uses, including greenways, open space, and trails. The provision of these facilities would be expected to offset the increased demand for such facilities because project residents would be expected to use the facilities closest to where they live.

The impacts associated with construction of these open space and recreational facilities have been evaluated throughout this Draft EIR. The project would not result in the off-site construction of new or expanded existing park facilities. Therefore, 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 proposed project would not result in a need for new or expanded public facilities such as libraries.

Impact Analysis

The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population. The population growth facilitated by the project would increase demand for other public facilities.

The Orange Public Library & Historic Center provides library services to the City of Orange. The closest library to the project site is the Charles P. Taft Library, located at 740 E. Taft Avenue. The City’s General Plan does not include any standards or goals for the provision of library services.

The project’s potential increase in population is a nominal increase compared with the existing population served by local libraries, and would not be expected to require new or substantially altered library facilities. 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.
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3.15 - Recreation

3.15.1 - Introduction

This section describes the existing public services and potential effects from project implementation on the project site and its surrounding area. Descriptions and analysis in this section are based, in part, on information provided by the Orange County Parks (OC Parks) website and the City of Orange General Plan.

3.15.2 - Environmental Setting

Parks

Regional

OC Parks operates 22 regional parks and preserves throughout Orange County. The closest park to the project site is Santiago Oaks Regional Park, which is located 0.25 mile to the east.

Santiago Oaks Regional Park

The 1,269-acre Santiago Oaks Regional Park encompasses Santiago Creek and the lower slopes of the Santa Ana Mountains. The regional park offers trails available for hiking, biking, or horseback riding.

Local

The City of Orange owns and currently maintains 24 parks, which consist of approximately 251 acres of parkland. The following three types of park facilities are available for recreational use by City residents and could be subject to impact from increased demand for recreational use as the City population increases:

- Neighborhood Parks (4 to 10 acres with a 0.5- to 1-mile radius service area) provide for the daily recreation needs of residents in the immediate area. Olive Park, El Modena Park, and Killefer Park are typical examples of the City’s neighborhood parks, which may include landscaped picnic areas, tot lots, hard court areas, multipurpose ball fields, and limited parking.

- Community Parks (15 to 40 acres with a service area radius of 1 to 2 miles) are larger in scale and provide a greater variety of recreational opportunities and facilities. Hart Park, Grijalva Park, and El Camino Real Park are typical examples of the City’s community parks, which host active organized sports leagues, have lighted sports fields, may provide recreational instruction, and have sufficient area for larger community events.

- Regional Parks are typically 200 acres or larger in size and provide a greater diversity of recreational activities that cannot be fully met by neighborhood or community parks. For Orange residents, the three county regional parks that serve these needs are Irvine Park, Peters Canyon Park, and Santiago Oaks Park.

In addition to these three types of parks that provide opportunity for active recreation, the City also maintains Special Use Facilities that provide passive uses and historic or aesthetic amenities. These
facilities include historic community assets such as Plaza Park, Pitcher Park, and Depot Park. The City’s community gardens and senior center also provide specialized activities.

**Trails**

*Santiago Creek Bike Trail*

The Santiago Creek Bike Trail, a paved Class I multi-use path, follows Santiago Creek from N. Broadway to N. Cannon Street, a distance of approximately 6 miles.

*Santiago Creek Trail*

The unpaved Santiago Creek Trail extends along the north bank of the creek from N. Cannon Street to Santiago Oaks Regional Park.

**3.15.3 - Regulatory Framework**

**State**

*Quimby Act*

The Quimby Act (Government Code Section 66477) allows local governments to require developers to dedicate land, donate conservation easements, or pay fees to fund parkland development. The Quimby Act has a standard of 3.5 acres of parkland per 1,000 residents.

**Local**

*City of Orange*

The City of Orange General Plan sets forth the following goals and policies that are relevant to recreation:

**Land Use Element**

- **Goal 1**: Meet the present and future needs of all residential and business sectors with a diverse and balanced mix of land uses.
- **Policy 1.7**: Provide a range of open space and park amenities to meet the diverse needs of current and new residents.
- **Goal 6.0**: Advance development activity that is mutually beneficial to both the environment and the community.
- **Policy 6.3**: Establish and maintain greenways, and pedestrian and bicycle connections that complement the residential, commercial and open space areas they connect.
- **Policy 6.4**: Create and maintain open space resources that provide recreational opportunities, protect hillside vistas and ridgelines, and conserve natural resources.

**3.15.4 - Methodology**

FCS reviewed information about recreation providers in the project vicinity. The OC Parks website and City of Orange General Plan were reviewed for relevant information.
3.15.5 - Thresholds of Significance

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

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

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

3.15.6 - Project Impacts and Mitigation Measures

Increase Use of Parks

| Impact REC-1: The project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. |

Impact Analysis
The proposed project would develop up to 129 dwelling units, which would add 396 new residents to the City’s population. The population growth facilitated by the project would increase demand for recreational facilities.

The proposed project would provide 69 acres of open space and recreation uses, including active use facilities (trail network) and passive use areas (open space and greenway). The provision of these facilities would be expected to offset the increased demand for such facilities because project residents would be expected to use the facilities closest to where they live.

The impacts associated with construction of this open space and recreational facilities have been evaluated throughout this Draft EIR. The project would not result in the off-site construction of new or expanded existing park facilities. Therefore, 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.
Recreational Facilities Physical Effect on Environment

Impact REC-2: The project would not include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Impact Analysis
The proposed project would provide 69 acres of open space and recreation uses, including active use facilities (trail network) and passive use areas (open space and greenway). The impacts associated with construction of this open space and recreational facilities have been evaluated throughout this Draft EIR. The project would not result in the off-site construction of new or expanded existing park facilities. Therefore, 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.
3.16 - Transportation and Traffic

This section describes the transportation and traffic setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on the Traffic Impact Analysis prepared by Linscott, Law, & Greenspan, Engineers, which is provided in Appendix J.

3.16.1 - Existing Conditions

Roadway Network

Regional access to the site is provided via the State Route 55 (SR-55) and the SR-241 freeways. The principal local network of streets serving the proposed project includes Santiago Canyon Road and Cannon Street. The following discussion provides a brief synopsis of these key area streets. The descriptions are based on an inventory of existing roadway conditions. Exhibit 3.16-1 depicts the street system, including study facilities. Exhibit 3.16-2 presents an inventory of the existing roadway conditions for the arterials and intersections evaluated in this section; this exhibit identifies the number of travel lanes for key arterials, as well as intersection configurations and controls for the key area study intersections.

Santiago Canyon Road

Santiago Canyon Road is generally a four-lane divided roadway that borders the project site on the south. Between Newport Boulevard and Jamboree Road, Santiago Canyon Road is a six-lane roadway. Santiago Canyon Road will provide ingress/egress to the project site via one full access signalized driveway, located directly opposite Nicky Way. On-street parking is generally not permitted along this roadway within the vicinity of the Project. The posted speed limit on Santiago Canyon Road is 55 miles per hour (mph) west of Hewes Street, 45 mph between Hewes Street and Cannon Street and 50 mph east of Cannon Street. Traffic signals control the study intersections of Santiago Canyon Road at Hewes Street, Cannon Street, Orange Park Boulevard, Meads Avenue, Newport Boulevard, and Jamboree Road.

Cannon Street

Cannon Street is a four-lane divided roadway oriented in the north-south direction. On-street parking is generally not permitted along this roadway within the vicinity of the project. The posted speed limit on Cannon Street is 45 mph north of Santiago Canyon Road and 40 mph south of Santiago Canyon Road. Traffic signals control the study intersections of Cannon Street at Serrano Avenue, Taft Avenue and Santiago Canyon Road.

Study Facilities

Ten key study intersections and 17 key roadway segments selected for evaluation were determined based on coordination with City of Orange Traffic Engineering staff and application of the “51 or more peak hour trip threshold” outlined in the City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007. The intersections and roadway segments listed below provide local access to the study area and define the extent of the boundaries for this traffic impact investigation. The study facilities are summarized in Table 3.16-1.
<table>
<thead>
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<th>Jurisdiction</th>
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</thead>
<tbody>
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<td>1</td>
<td>Intersection</td>
<td>Cannon Street/Serrano Avenue</td>
<td>City of Orange</td>
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<td>2</td>
<td>Intersection</td>
<td>Cannon Street/Taft Avenue</td>
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<td>Intersection</td>
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<td>City of Orange</td>
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<td>Orange Park Boulevard/Santiago Canyon Road</td>
<td>City of Orange</td>
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<td>6</td>
<td>Intersection</td>
<td>Meads Avenue/Santiago Canyon Road</td>
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<td>Intersection</td>
<td>Newport Boulevard/Santiago Canyon Road</td>
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<td>Intersection</td>
<td>Jamboree Road/Santiago Canyon Road</td>
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<tr>
<td>C</td>
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</tr>
<tr>
<td>D</td>
<td>Roadway Segment</td>
<td>Cannon Street south of Santiago Canyon Road</td>
<td>City of Orange</td>
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<tr>
<td>E</td>
<td>Roadway Segment</td>
<td>Villa Park Road west of Hewes Street</td>
<td>City of Orange</td>
</tr>
<tr>
<td>F</td>
<td>Roadway Segment</td>
<td>Hewes Street south of Villa Park Road</td>
<td>City of Orange</td>
</tr>
<tr>
<td>G</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road between Hewes Street and Cannon Street</td>
<td>City of Orange</td>
</tr>
<tr>
<td>H</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road between Nicky Way and Orange Park Boulevard</td>
<td>City of Orange</td>
</tr>
<tr>
<td>I</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road between Orange Park Boulevard and Meads Avenue</td>
<td>City of Orange</td>
</tr>
<tr>
<td>J</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road between Meads Avenue and Newport Boulevard</td>
<td>City of Orange</td>
</tr>
<tr>
<td>K</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road between Newport Boulevard and Jamboree Road</td>
<td>City of Orange</td>
</tr>
<tr>
<td>L</td>
<td>Roadway Segment</td>
<td>Jamboree Road between Santiago Canyon Road and Chapman Avenue</td>
<td>City of Orange</td>
</tr>
<tr>
<td>M</td>
<td>Roadway Segment</td>
<td>Jamboree Road south of Chapman Avenue/Santiago Canyon Road</td>
<td>City of Orange</td>
</tr>
<tr>
<td>N</td>
<td>Roadway Segment</td>
<td>Santiago Canyon Road east of Jamboree Road</td>
<td>City of Orange</td>
</tr>
<tr>
<td>O</td>
<td>Roadway Segment</td>
<td>Chapman Avenue between Cannon Street and Orange Park Boulevard</td>
<td>City of Orange</td>
</tr>
<tr>
<td>P</td>
<td>Roadway Segment</td>
<td>Chapman Avenue between Orange Park Boulevard and Newport Boulevard</td>
<td>City of Orange</td>
</tr>
<tr>
<td>Q</td>
<td>Roadway Segment</td>
<td>Orange Park Boulevard between Santiago Canyon Road and Chapman Avenue</td>
<td>City of Orange</td>
</tr>
</tbody>
</table>

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Exhibit 3.16-2
Existing Roadway Conditions and Intersection Controls

Source: Linscott, Law & Greenspan, Engineers 2017
The Level of Service (LOS) investigations at these key locations were used to evaluate the potential traffic-related impacts associated with area growth, cumulative projects and the proposed project. When necessary, this report recommends intersection and/or roadway segment improvements that may be required to accommodate future traffic volumes and restore/maintain an acceptable Level of Service and/or mitigate the impact of the project.

Existing Traffic Volumes

Ten key study intersections and 17 key roadway segments have been identified as the locations at which to evaluate existing and future traffic operating conditions. Some portion of potential project-related traffic will pass through each of these intersections/roadway segments, and their analysis will reveal the expected relative impacts of the project. These key intersections and key roadway segments were selected for evaluation based on coordination with City of Orange Traffic Engineering staff and application of the “51 or more peak hour trip threshold” outlined in the City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007.

Existing daily, AM and PM peak-hour traffic volumes for the 10 key study intersections and 17 key roadway segments evaluated in this report were obtained from daily machine and manual peak-hour turning movement counts conducted by Transportation Studies Inc. in January 2017. Exhibit 3.16-3 and Exhibit 3.16-4 illustrate the existing AM and PM peak-hour traffic volumes at the 10 key study intersections evaluated in this report, respectively. Exhibit 3.16-4 also presents the existing average daily traffic volumes for the 14 roadway segments in the vicinity of the project.

Appendix J contains the detailed peak-hour count sheets for the key intersections evaluated in this report. Appendix J also contains the average daily traffic volumes for the key roadway segments.

Intersection Operations

Existing AM and PM peak-hour operating conditions for the 10 key study intersections were evaluated using the Intersection Capacity Utilization (ICU) methodology for signalized intersections.

Intersection Capacity Utilization (ICU) Method of Analysis (Signalized Intersections)

In conformance with City of Orange and County of Orange requirements, existing AM and PM peak-hour operating conditions for the key signalized study intersections were evaluated using the Intersection Capacity Utilization (ICU) method. The ICU technique is intended for signalized intersection analysis and estimates the volume to capacity (V/C) relationship for an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU numerical value represents the percent signal (green) time and thus capacity, required by existing and/or future traffic. It should be noted that the ICU methodology assumes uniform traffic distribution per intersection approach lane and optimal signal timing.

Consistent with City of Orange and County of Orange requirements, the ICU calculations use a lane capacity of 1,700 vehicles per hour (vph) for through and all turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation. Consistent with Orange County Congestion Management Plan requirements, the ICU calculations use a lane capacity of 1,700 vph.
for left-turn, through, and right-turn lanes. A clearance adjustment factor of 0.05 was added to each Level of Service calculation.

The ICU value translates to a Level of Service (LOS) estimate, which is a relative measure of the intersection performance. The ICU value is the sum of the critical volume to capacity ratios at an intersection; it is not intended to be indicative of the LOS of each of the individual turning movements. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in Table 3.16-2.

### Table 3.16-2: Level of Service Criteria for Signalized Intersections

<table>
<thead>
<tr>
<th>Level of Service (LOS)</th>
<th>Intersection Capacity Utilization Value (V/C)</th>
<th>Level of Service Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>&lt; 0.60</td>
<td>EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.</td>
</tr>
<tr>
<td>B</td>
<td>0.61–0.70</td>
<td>VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.</td>
</tr>
<tr>
<td>C</td>
<td>0.71–0.80</td>
<td>GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.</td>
</tr>
<tr>
<td>D</td>
<td>0.81–0.90</td>
<td>FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.</td>
</tr>
<tr>
<td>E</td>
<td>0.91–1.00</td>
<td>POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.</td>
</tr>
<tr>
<td>F</td>
<td>&gt; 1.00</td>
<td>FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.</td>
</tr>
</tbody>
</table>


**Volume to Capacity (V/C) Ratio Method of Analysis (Roadway Segments)**

Existing daily operating conditions for the 17 key roadway segments have been investigated according to the daily volume-to-capacity (V/C) ratio of each link. The daily V/C relationship is used to estimate the LOS of the roadway segment with the volume based on 24-hour traffic count data and the capacity based on the street classifications contained within the City of Orange General Plan Circulation and Mobility Element. The daily roadway link capacity of each street classification according to the City of Orange General Plan Circulation and Mobility Element is presented in Table 3.16-3, along with the six corresponding service levels and associated V/C ratios.
Exhibit 3.16-3
Existing AM Peak Hour Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
Exhibit 3.16-4
Existing PM Peak Hour and Daily Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
Table 3.16-3: Roadway Link Capacities

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>Number of Lanes</th>
<th>Level of Service Criteria with Associated Roadway Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Daily Values (VPD) Level of Service (LOS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
</tr>
<tr>
<td>Principal</td>
<td>8 lanes divided</td>
<td>45,000</td>
</tr>
<tr>
<td>Major</td>
<td>6 lanes divided</td>
<td>33,900</td>
</tr>
<tr>
<td>Primary</td>
<td>4 lanes divided</td>
<td>22,500</td>
</tr>
<tr>
<td>Secondary</td>
<td>4 lanes divided</td>
<td>14,400</td>
</tr>
<tr>
<td>Collector</td>
<td>2 lanes divided</td>
<td>7,200</td>
</tr>
<tr>
<td>V/C Ratio</td>
<td></td>
<td>≤ 0.60</td>
</tr>
</tbody>
</table>

Note:
VPD = vehicles per day

Level of Service Criteria

City of Orange Locations

According to the City of Orange General Plan Circulation Element and stated in the City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections and LOS D is the minimum acceptable condition that should be maintained on all roadway segments.

County of Orange Locations

According to the County of Orange criteria, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections and LOS C is the minimum acceptable condition that should be maintained on all roadway segments.

Existing Level of Service Results

Intersections

Table 3.16-4 summarizes the existing peak-hour service level calculations for the 10 key study intersections based on existing traffic volumes and current street geometry. Review of Table 3.16-4 indicates that two of the 10 key study intersections currently operate at unacceptable levels of service during the AM and/or PM peak hours. The remaining seven key study intersections currently operate at an acceptable service level during the AM and PM peak hours.
Table 3.16-4: Existing Peak-Hour Levels of Service

<table>
<thead>
<tr>
<th>Key Intersection</th>
<th>Time Period</th>
<th>Jurisdiction</th>
<th>Minimum Acceptable LOS</th>
<th>Control Type</th>
<th>ICU</th>
<th>LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cannon St/Serrano Ave</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>3Ø Traffic Signal</td>
<td>0.847</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.912</td>
<td></td>
</tr>
<tr>
<td>2 Cannon St/Taft Ave</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>5Ø Traffic Signal</td>
<td>0.983</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.869</td>
<td></td>
</tr>
<tr>
<td>3 Hewes St/Villa Park Rd</td>
<td>AM</td>
<td>County of Orange</td>
<td>D</td>
<td>3Ø Traffic Signal</td>
<td>0.742</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.627</td>
<td></td>
</tr>
<tr>
<td>4 Cannon St/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>6Ø Traffic Signal</td>
<td>0.749</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.739</td>
<td></td>
</tr>
<tr>
<td>5 Orange Park Blvd/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>6Ø Traffic Signal</td>
<td>0.838</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.881</td>
<td></td>
</tr>
<tr>
<td>6 Meads Ave/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>5Ø Traffic Signal</td>
<td>0.784</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.768</td>
<td></td>
</tr>
<tr>
<td>7 Newport Blvd/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>3Ø Traffic Signal</td>
<td>0.767</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.832</td>
<td></td>
</tr>
<tr>
<td>8 Jamboree Rd/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>3Ø Traffic Signal</td>
<td>0.641</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.647</td>
<td></td>
</tr>
<tr>
<td>9 Jamboree Rd/Chapman Ave/Santiago Canyon Rd</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>8Ø Traffic Signal</td>
<td>0.533</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.845</td>
<td></td>
</tr>
<tr>
<td>10 Orange Park Boulevard/Chapman Avenue</td>
<td>AM</td>
<td>City of Orange</td>
<td>D</td>
<td>6Ø Traffic Signal</td>
<td>0.418</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
<td></td>
<td>0.530</td>
<td></td>
</tr>
</tbody>
</table>

Note:
Ø = phase

Roadway Segments

Table 3.16-5 summarizes the existing service level calculations for the 17 key roadway segments based on existing 24-hour traffic volumes and current roadway geometry. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS “E” capacity. The fourth column (4) shows the daily volume, V/C ratio and resulting level of service.

Review of Table 3.16-5 indicates that one (1) of the fourteen key roadway segments currently operates at an unacceptable level of service. Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) currently operates at unacceptable LOS F. The remaining 13 key roadway segments currently operate at an acceptable service level.
Table 3.16-5: Existing Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Existing Configuration</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Existing Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cannon St north of Serrano Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>20,171</td>
</tr>
<tr>
<td>B Cannon St between Serrano Ave and Taft Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>39,787</td>
</tr>
<tr>
<td>C Cannon St between Taft Ave and Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>31,799</td>
</tr>
<tr>
<td>D Cannon St south of Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>8,940</td>
</tr>
<tr>
<td>E Villa Park Rd west of Hewes St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>24,423</td>
</tr>
<tr>
<td>F Hewes St south of Villa Park Rd</td>
<td>4U</td>
<td>Secondary Arterial</td>
<td>24,000</td>
<td>8,807</td>
</tr>
<tr>
<td>G Santiago Canyon Rd between Hewes St and Cannon St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,118</td>
</tr>
<tr>
<td>H Santiago Canyon Rd between Nicky Way and Orange Park Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>29,009</td>
</tr>
<tr>
<td>I Santiago Canyon Rd between Orange Park Blvd and Meads Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,936</td>
</tr>
<tr>
<td>J Santiago Canyon Rd between Meads Ave and Newport Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,303</td>
</tr>
<tr>
<td>K Santiago Canyon Rd between Newport Blvd and Jamboree Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,861</td>
</tr>
<tr>
<td>L Jamboree Rd between Santiago Canyon Rd and Chapman Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,820</td>
</tr>
<tr>
<td>M Jamboree Rd south of Chapman Ave/Santiago Canyon Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,533</td>
</tr>
<tr>
<td>N Santiago Canyon Rd east of Jamboree Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>22,526</td>
</tr>
<tr>
<td>O Chapman Avenue between Cannon Street and Orange Park Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>19,482</td>
</tr>
<tr>
<td>P Chapman Avenue between Orange Park Boulevard and Newport Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>23,154</td>
</tr>
<tr>
<td>Q Orange Park Boulevard between Santiago Canyon Road and Chapman Avenue</td>
<td>2D</td>
<td>Collector</td>
<td>12,000</td>
<td>4,311</td>
</tr>
</tbody>
</table>

Public Transit

Orange County Transportation Authority (OCTA) provides bus service within Orange County. The closest OCTA bus route to the project site is Route 54, which travels between Santiago Canyon College in Orange and Eastgate Plaza Shopping Center in Garden Grove. The closest Route 54 stop is on Santiago Canyon Road in the vicinity of Santiago Canyon College, approximately 2 miles from the project site.

Route 54 provides service 7 days a week, with service between 4:40 a.m. and 11:43 p.m. on weekdays, 5:59 a.m. to 10:04 p.m. on Saturdays, and 6:29 a.m. and 9:24 p.m. on Sundays and holidays.

Bicycle Circulation

Class II bike lanes (on-road bike lanes delineated by painted strips and other features) exist along the following roadway segments within the vicinity of the project:

- Santiago Canyon Road
- Serrano Avenue
- Taft Avenue
- Cannon Street
- Newport Avenue
- Chapman Avenue
- Jamboree Road

Additionally, Class I bike paths (off-road bike paths) exist west of Jamboree Road, extending from Chapman Avenue to the Irvine Park, west of Hewes Street, extending from Bond Avenue to Villa Park Road, north of Villa Park Road, extending from Hewes Street to Cannon Street, and west of Cannon Street, extending approximately 1,000 feet north of Santiago Canyon Road.

Pedestrian Circulation

Pedestrian circulation is provided via existing public sidewalks along Santiago Canyon Road, Chapman Avenue, Jamboree Road, and other key roadway segments. Portions of Santiago Canyon Road (i.e., between Newport Boulevard and Meads Avenue) do not provide consistent sidewalks. Additionally, equestrian paths are provided throughout the vicinity of the project, particularly along Santiago Canyon Road.

3.16.2 - Regulatory Setting

Local

City of Orange

General Plan

The City of Orange General Plan sets forth the following goals and policies associated with transportation that are relevant to the proposed project:
Circulation Element

- **Goal 1.0**: Provide a safe, efficient, and comprehensive circulation system that serves local needs, meets forecasted demands, and sustains quality of life in neighborhoods.
- **Policy 1.1**: Plan, build, and maintain an integrated, hierarchical, and multi-modal system of roadways, pedestrian walkways, and bicycle paths throughout the City.
- **Policy 1.7**: Consolidate driveways along roadways that provide access to commercial uses to minimize side street interruption and promote smooth traffic flows.
- **Goal 4.0**: Provide efficient and accessible modes of pedestrian, bicycle, and equestrian transportation and improved facilities and amenities.
- **Policy 4.1**: Create a comprehensive bicycle network that is integrated with other transportation systems by establishing complementary on-street and off-street facilities as identified in the City of Orange Bikeways Master Plan and OCTA Commuter Bikeways Strategic Plan, including Santiago Creek, the Santa Ana River, and the Tustin Branch Trail.

Growth Management Element

- **Goal 1.0**: Reduce traffic congestion within the City.
- **Policy 1.1**: Establish LOS D as the level of service standard for traffic circulation within the City for both roadway segments and peak-hour signalized intersection movements.
- **Policy 1.2**: Ensure completion of transportation improvements as agreed upon by the City and developer prior to completion of a development project.
- **Policy 1.3**: Ensure that new development pays its fair share of street improvement costs, including regional traffic mitigation. New revenues generated from Measure M, if available, shall not be used to replace private developer funding which has been omitted for any project.
- **Policy 1.4**: Continue to collect transportation impact fees for improvements within the City boundaries and work with adjacent jurisdictions to determine that an appropriate level of transportation impact fees are maintained within the established County GMAs.
- **Policy 1.9**: Ensure that new developments incorporate non-motorized and alternative transit amenities such as bike racks, bus benches and shelters, and pedestrian connections.

Performance Standards

The City of Orange sets forth the following performance standards for intersections and roadway segments. A project may have a significant impact if any of the following occur:

**Intersections**

- An unacceptable peak hour Level of Service (LOS) at any of the key intersections is projected. According to the City’s Circulation Element and stated in the City of Orange Traffic Impact Analysis Guidelines, dated August 15, 2007, LOS D is the minimum acceptable condition that should be maintained during the morning and evening peak commute hours on all intersections; and
- The project increases traffic demand at the study intersection by 1% of capacity (ICU increase ≥ 0.010), causing or worsening LOS E or LOS F (ICU > 0.900).

**Roadway Segments**

- An unacceptable daily Level of Service (LOS) at any of the key roadway segments is projected. According to the City of Orange General Plan Circulation Element and stated in the City of
Orange Traffic Impact Analysis Guidelines, dated August 15, 2007, LOS D is the minimum acceptable condition that should be maintained on all roadway segments; and

- The project increases traffic demand at the roadway segment by 1% of capacity ($V/C$ increase $\geq 0.010$), causing or worsening LOS E or LOS F ($V/C > 0.900$).

**County of Orange**

*Performance Standards*

The County of Orange sets forth the following performance standards for intersections and roadway segments. A project may have a significant impact if any of the following occur:

**Intersections**

- The County of Orange along with City of Orange considers LOS D to be the minimum acceptable condition that should be maintained during the AM and PM peak hours for all intersections. For this report, impacts to local and regional transportation systems shall be considered significant if the project increases traffic demand at a key study intersection by 1.0% of capacity (ICU increase $\geq 0.01$), causing or worsening LOS E or F (ICU > 0.90). This criteria is based on the “1% measurable impact criteria” contained in the County of Orange Transportation Implementation Manual (TIM) guidelines.

**Roadway Segments**:

- An unacceptable daily Level of Service (LOS) at any of the key roadway segments is projected. According to the Guidance for Administration of the Orange County Master Plan of Arterial Highways, dated October 22, 2012, LOS C is the minimum acceptable condition that should be maintained on all roadway segments; and

- The project increases traffic demand at the roadway segment by 1% of capacity ($V/C$ increase $\geq 0.010$), causing or worsening LOS D, LOS E or LOS F ($V/C > 0.800$).

**3.16.3 - Methodology**

Linscott, Law, & Greenspan, Engineers prepared a Traffic Impact Analysis. The methodology of the analysis is described as follows. The report is provided in Appendix J.

**Traffic Forecasting Methodology**

In order to estimate the traffic impact characteristics of the proposed project, a multi-step process has been utilized. The first step is trip generation, which estimates the total arriving and departing traffic on a peak-hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area.
The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment is typically based on minimization of travel time, which may or may not involve the shortest route, depending on prevailing operating conditions and travel speeds. Traffic distribution patterns are indicated by general percentage orientation, while traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

With the forecasting process complete and project traffic assignments developed, the impact of the proposed project is isolated by comparing operational (LOS) conditions at selected key intersections using expected future traffic volumes with and without forecast project traffic. The need for site-specific and/or cumulative local area traffic improvements can then be evaluated and the significance of the project’s impacts identified.

**Project Traffic Generation**

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Generation equations and/or rates used in the traffic forecasting procedure are found in the 9th Edition of Trip Generation, published by the Institute of Transportation Engineers (ITE) [Washington D.C., 2012].

Table 3.16-6 summarizes the trip generation rates used in forecasting the vehicular trips generated by the proposed project and the existing entitled land use (i.e., the Existing Materials Recycling and Backfilling Operation) and also presents the project’s forecast peak-hour and daily traffic volumes. As shown in the upper portion of Table 3.16-6, the trip generation potential of the proposed project was estimated using trip rates for ITE Land Use Code 210: Single-Family Detached Housing. The trip generation potential of the existing/entitled land use is based on traffic counts conducted during normal operation in October/November 2010 and adjusted to account for the entitled 7:00 a.m. to 7:00 p.m. operation.

Review of the middle portion of Table 3.16-6 shows that the proposed project is forecast to generate 1,228 daily trips, with 97 trips (24 inbound, 73 outbound) produced in the AM peak hour and 129 trips (81 inbound, 48 outbound) produced in the PM peak hour on a “typical” weekday.

For the existing entitled land use, a review of the lower portion of Table 3.16-6 shows that the existing trip generation potential of the Existing Materials Recycling and Backfilling Operation based on existing counts totals 686 daily trips, with 63 trips (34 inbound, 29 outbound) produced in the AM peak hour and 32 trips (15 inbound, 17 outbound) produced in the PM peak hour. It should be noted that the Daily and PM peak-hour trips include additional traffic generation based on an extrapolation of the existing site traffic count data to 7:00 p.m..

Review of the last row of Table 3.16-6 shows that with application of existing trip credits, the proposed project is forecast to generate a net increase of 542 daily trips, a net increase of 34 AM peak-hour trips (-10 inbound, 44 outbound) and a net increase of 97 PM peak-hour trips (66 inbound, 31 outbound). The potential traffic impacts of these increased project trips are evaluated in the traffic impact analysis section of this report. It should be noted that the trip generation methodology and forecasts were approved by City of Orange staff prior to undertaking the analysis.
It should be noted that considering the significant amount of truck traffic associated with the entitled use on the site, the net project traffic generation forecast for the project could include the application of passenger car equivalents (PCE's) for the trucks that utilized the site as part of the entitled Materials Recycling & Backfilling Operation that has been operating on the site. The volume and type (axles) of trucks was derived from the traffic counts conducted in 2011 when the site operation was at its peak. As such, the net project traffic generation forecast, based on PCE factors, results in -242 net daily trips, with -32 net AM peak-hour trips (-44 inbound, 12 outbound) and 63 net PM peak-hour trips (50 inbound, 13 outbound). Compared with the net traffic generation forecast presented in Table 3.16-6, the net project traffic generation has 784 fewer daily trips, 66 fewer AM peak-hour trips, and 34 fewer PM peak-hour trips with the application of the PCE factors.

**Table 3.16-6: Project Traffic Generation Forecast**

<table>
<thead>
<tr>
<th>ITE Land Use Code/Project Description</th>
<th>Daily 2-Way</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily Enter</td>
<td>AM Enter</td>
<td>Exit</td>
</tr>
<tr>
<td>Generation Factors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>210: Single-Family Detached Housing (TE/DU)</td>
<td>9.52</td>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>Proposed Project Generation Forecast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rio Santiago Residential (129 DU)</td>
<td>1,228</td>
<td>24</td>
<td>73</td>
</tr>
<tr>
<td>Existing Entitled Land Use</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing Materials Recycling &amp; Backfilling Operation¹</td>
<td>686</td>
<td>34</td>
<td>29</td>
</tr>
<tr>
<td>Total Net Traffic Generation Forecast</td>
<td>542</td>
<td>-10</td>
<td>44</td>
</tr>
</tbody>
</table>

Note:
¹ Based on traffic counts conducted during normal operation in October/November 2010 and adjusted to account for a 7:00 a.m. to 7:00 p.m. operation. These entitled trips will be added to the existing traffic.


**Project Traffic Distribution and Assignment**

Exhibit 3.16-5 illustrates the general, directional traffic distribution pattern for the proposed project. Project traffic volumes both entering and exiting the project site have been distributed and assigned to the adjacent street system based on the following considerations:

- Directional flows on the freeways in the immediate vicinity of the project site (i.e., SR-55 and SR-241 freeways),
- The site’s proximity to major traffic carriers (i.e., Santiago canyon Road),
- Expected localized traffic flow patterns based on adjacent street channelization and presence of traffic signals,
- Ingress/egress availability at the project site, and
Trip distribution information contained within the Rio Santiago TIA, prepared by Vista Environmental, dated January 2013.

The anticipated AM and PM peak-hour project traffic volumes associated with the project are presented in Exhibit 3.16-6 and Exhibit 3.16-7, respectively. Exhibit 3.16-7 also presents the daily project traffic volumes. The traffic volume assignments presented in Exhibit 3.16-6 and Exhibit 3.16-7 reflect the traffic distribution characteristics shown in Exhibit 3.16-5 and the traffic generation forecast presented in Table 3.16-6.

**Modified Existing Traffic Conditions**

As discussed with City of Orange staff, given that operations at the site are currently limited and unpredictable, the trips generated by the existing entitled land use (i.e., 686 daily trips, 63 AM peak-hour trips and 32 PM peak-hour trips) have been added to the existing daily, AM peak hour and PM peak-hour traffic condition resulting in a “Modified Existing” traffic condition. Exhibit 3.16-8 and Exhibit 3.16-9 present the Modified Existing AM and PM peak-hour traffic volumes at the 10 key study intersections. Exhibit 3.16-9 also presents the Modified Existing daily traffic volumes.

**Existing With Project Traffic Conditions**

The Existing With Project traffic conditions have been generated based upon existing conditions and the estimated project traffic. These forecast traffic conditions have been prepared pursuant to the California Environmental Quality Act (CEQA) guidelines, which require that the potential impacts of a project be evaluated upon the circulation system as it currently exists. This traffic volume scenario and the related intersection capacity analyses will identify the roadway improvements necessary to mitigate the direct traffic impacts of the project, if any. Exhibit 3.16-10 and Exhibit 3.16-11 present projected AM and PM peak-hour traffic volumes at the 10 key study intersections and project driveway with the addition of the trips generated by the project to existing traffic volumes (i.e., modified existing traffic volumes), respectively. Exhibit 3.16-11 also presents the Existing With Project daily traffic volumes.

**Future Traffic Conditions**

**Year 2022 Without Project Traffic Conditions**

**Ambient Growth Traffic**

Horizon year, background traffic growth estimates have been calculated using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown and future cumulative projects in the study area, as well as account for regular growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic volumes has been calculated at one percent (1.0%) per year. Applied to the Year 2017 existing traffic volumes, this factor results in a 5.0% growth in existing volumes to the near-term horizon Year 2022. It should be noted that the five percent (5%) growth was applied to the Modified Existing traffic volumes shown previously in Exhibit 3.16-8 and Exhibit 3.16-9.

**Cumulative Projects Traffic**

In order to make a realistic estimate of future on-street conditions prior to implementation of the proposed project, the status of other known development projects (cumulative projects) in the
vicinity of the proposed project has been researched at the City of Orange. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development. Based on our research, there are four cumulative projects in the City of Orange within the vicinity of the subject site that have either been built but not yet fully occupied, or are being processed for approval. These four cumulative projects have been included as part of the cumulative background setting.

Table 3.16-7 provides a brief description and location for each of the four cumulative projects. Exhibit 3.16-12 graphically illustrates the location of the four cumulative projects. These cumulative projects are expected to generate vehicular traffic, which may affect the operating conditions of the key study intersections and key roadway segments.

Table 3.16-8 presents the development totals and resultant trip generation for the four cumulative projects. As shown in Table 3.16-8, the cumulative projects are forecast to generate a total of 11,969 daily trips, with 960 trips (282 inbound and 678 outbound) forecast during the AM peak hour and 1,192 trips (832 inbound and 360 outbound) forecast during the PM peak hour.

The AM and PM peak-hour traffic volumes associated with the four cumulative projects are presented in Exhibit 3.16-13 and Exhibit 3.16-14, respectively. Exhibit 3.16-14 also presents the daily cumulative project traffic volumes.

**Table 3.16-7: Location and Description of Cumulative Projects**

<table>
<thead>
<tr>
<th>No.</th>
<th>Cumulative Project</th>
<th>Location/Address</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Salem Lutheran Church Expansion</td>
<td>Southwest corner of Orange Park Blvd and Santiago Canyon Rd</td>
<td>7.388 TSF church expansion</td>
</tr>
<tr>
<td>2</td>
<td>Arena Site Single-Family Homes</td>
<td>Southeast corner of Santiago Canyon Rd and Nicky Way</td>
<td>7 single-family homes</td>
</tr>
<tr>
<td>3</td>
<td>Santiago Hills II</td>
<td>North and south sides of Santiago Canyon Rd, west of SR-241</td>
<td>1,066 single-family homes 114 condominiums 9.4-acre park</td>
</tr>
<tr>
<td>4</td>
<td>Olson Project</td>
<td>South of Washington Ave and Hamlin St</td>
<td>37 townhomes</td>
</tr>
</tbody>
</table>

Exhibit 3.16-5
Project Trip Distribution Pattern

Source: Linscott, Law & Greenspan, Engineers 2017
Exhibit 3.16-6
AM Peak Hour Project Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
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Exhibit 3.16-10
Modified With Project AM Peak Hour Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
Exhibit 3.16-11
Modified With Project PM Peak Hour and Daily Traffic Volumes
Exhibit 3.16-12
Cumulative Project Location Map

Source: Linscott, Law & Greenspan, Engineers 2017
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Table 3.16-8: Cumulative Projects Traffic Generation Forecast

<table>
<thead>
<tr>
<th>Cumulative Project Description</th>
<th>Daily 2-Way</th>
<th>AM Peak Hour</th>
<th>PM Peak Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Enter</td>
<td>Exit</td>
</tr>
<tr>
<td>1 Salem Lutheran Church Expansion</td>
<td>67</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>2 Arena Site Single-Family Homes</td>
<td>67</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3 Santiago Hills II</td>
<td>11,620</td>
<td>275</td>
<td>659</td>
</tr>
<tr>
<td>4 Olson Project</td>
<td>215</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td><strong>Cumulative Projects</strong></td>
<td><strong>11,969</strong></td>
<td><strong>282</strong></td>
<td><strong>678</strong></td>
</tr>
<tr>
<td><strong>Total Trip Generation Potential</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Year 2022 Traffic Volumes

Exhibit 3.16-15 and Exhibit 3.16-16 present the AM and PM peak-hour cumulative traffic volumes (existing traffic + ambient growth traffic + cumulative project traffic) at the 10 key study intersections for the Year 2022, respectively. Exhibit 3.16-16 also presents the Year 2022 daily cumulative traffic volumes for the key roadway segments.

Exhibit 3.16-17 and Exhibit 3.16-18 illustrate the Year 2022 forecast AM and PM peak-hour traffic volumes, with the inclusion of the trips generated by the proposed project, respectively. Exhibit 3.16-18 also presents the Year 2022 With Project traffic volumes for the key roadway segments.

Year 2040 Buildout Traffic Volumes

As directed by City of Orange staff, Year 2035 buildout traffic volumes for the 10 key study intersections and 17 key roadway segments were obtained from the Santiago Hills II Traffic Study, prepared by Stantec Consulting Services Inc., dated May 6, 2016. Specifically, the “Year 2035 With Proposed SHIIPC and No EOPC Development” Orange Transportation Analysis Model (OTAM) runs from the Santiago Hills II Traffic Study were utilized. The Santiago Hills II Traffic Study provided Year 2035 daily, AM peak-hour and PM peak-hour background traffic volume data for all key study locations, except for the following locations:

1) Cannon Street at Serrano Avenue
2) Cannon Street at Taft Avenue
5) Orange Park Boulevard at Santiago Canyon Road
6) Meads Avenue at Santiago Canyon Road
A) Nicky Way at Santiago Canyon Road

In order to develop Year 2035 traffic volume forecasts for the aforementioned locations, AM peak-hour and PM peak-hour growth factors were derived by comparing the overall growth between existing traffic volumes and Year 2035 traffic volumes at common locations (i.e., Cannon Street at Santiago Canyon Road) from the Santiago Hills II Traffic Study. The traffic volume comparisons resulted in a 1.8% per year AM peak-hour growth factor and a 2.2% per year PM peak-hour growth.
factor. These growth factors were applied to the modified existing traffic volumes for the aforementioned locations to develop Year 2035 AM peak-hour and PM peak-hour background traffic volumes. It should be noted that adjustments were applied as warranted to ensure that through traffic along Santiago Canyon Road and Cannon Street reasonably tracked between each key study intersection.

After developing all Year 2035 daily, AM peak-hour and PM peak-hour background traffic volumes for the 10 key study intersections and 17 key roadway segments, a 1.0% per year growth factor was applied, as directed by City of Orange staff to develop Year 2040 daily, AM peak-hour, and PM peak-hour background traffic volumes.

Exhibit 3.16-19 and Exhibit 3.16-20 present the AM and PM peak hour Year 2040 buildout without project traffic volumes at the 10 key study intersections, respectively. Exhibit 3.16-20 also presents the Year 2040 daily buildout without project traffic volumes for the key roadway segments.

Exhibit 3.16-21 and Exhibit 3.16-22 illustrate the Year 2040 forecast AM and PM peak-hour traffic volumes, with the inclusion of the trips generated by the proposed project, respectively. Exhibit 3.16-22 also presents the Year 2040 daily with project traffic volumes for the key roadway segments.

3.16.4 - 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?
Exhibit 3.16-15
Year 2022 without Project AM Peak Hour Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
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Exhibit 3.16-18
Year 2022 with Project PM Peak Hour and Daily Traffic Volumes
Exhibit 3.16-19
Year 2040 Buildout without Project AM Peak Hour Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
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Exhibit 3.16-20
Year 2040 Buildout without Project PM Peak Hour and Daily Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
Exhibit 3.16-21
Year 2040 Buildout with Project AM Peak Hour Traffic Volumes

Source: Linscott, Law & Greenspan, Engineers 2017
Exhibit 3.16-22
Year 2040 Buildout with Project PM Peak Hour and Daily Traffic Volumes
3.16.5 - Project Impacts and Mitigation Measures

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

Existing With Project 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 Traffic Conditions.

Impact Analysis

This impact evaluates Existing With Project traffic conditions.

Intersections

Modified Existing Traffic Conditions

Table 3.16-9 summarizes the peak-hour level of service results at the 10 key study intersections for Modified Existing traffic conditions. The first column (1) of ICU/LOS values in Table 3.16-9 presents a summary of existing AM and PM peak-hour traffic conditions. The second column (2) presents Modified Existing traffic conditions, which includes trips generated by the existing entitled land use.

Table 3.16-9 indicates that two of the 10 key study intersections are forecast to operate at unacceptable levels of service during the AM and/or PM peak hours under Modified Existing traffic conditions. The remaining eight key study intersections are forecast to operate at an acceptable service level during the AM and PM peak hours.

Table 3.16-9: Modified Existing Peak-Hour Intersection Capacity Analysis

<table>
<thead>
<tr>
<th>Key Intersections</th>
<th>Time Period</th>
<th>Minimum Acceptable LOS</th>
<th>(1) Existing Traffic Conditions</th>
<th>(2) Modified Existing Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICU</td>
<td>LOS</td>
</tr>
<tr>
<td>1 Cannon St at Serrano Ave</td>
<td>AM PM</td>
<td>D</td>
<td>0.847</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.912</td>
<td>E</td>
</tr>
<tr>
<td>2 Cannon St at Taft Ave</td>
<td>AM PM</td>
<td>D</td>
<td>0.983</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.869</td>
<td>D</td>
</tr>
<tr>
<td>3 Hewes St at Villa Park Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.742</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.627</td>
<td>B</td>
</tr>
<tr>
<td>4 Cannon St at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.749</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.739</td>
<td>C</td>
</tr>
<tr>
<td>5 Orange Park Blvd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.838</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.881</td>
<td>D</td>
</tr>
<tr>
<td>6 Meads Ave at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.784</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.768</td>
<td>C</td>
</tr>
<tr>
<td>7 Newport Blvd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.767</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.832</td>
<td>D</td>
</tr>
</tbody>
</table>
Table 3.16-9 (cont.): Modified Existing Peak-Hour Intersection Capacity Analysis

<table>
<thead>
<tr>
<th>Key Intersections</th>
<th>Time Period</th>
<th>Minimum Acceptable LOS</th>
<th>(1) Existing Traffic Conditions</th>
<th>(2) Modified Existing Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 Jamboree Rd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>ICU 0.641 LOS B</td>
<td>ICU 0.644 LOS B</td>
</tr>
<tr>
<td>9 Jamboree Rd at Chapman Ave/Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>ICU 0.533 LOS A</td>
<td>ICU 0.535 LOS A</td>
</tr>
<tr>
<td>10 Orange Park Boulevard/Chapman Avenue</td>
<td>AM PM</td>
<td>D</td>
<td>ICU 0.418 LOS A</td>
<td>ICU 0.418 LOS A</td>
</tr>
</tbody>
</table>

Note:
A significant impact would occur if the project causes ICU to increase by 0.010 or more.

Existing With Project Traffic Conditions
Table 3.16-10 summarizes the peak-hour level of service results at the 10 key study intersections for Existing With Project traffic conditions. The first column (1) of ICU/LOS values in Table 3.16-10 presents a summary of Modified Existing AM and PM peak-hour traffic conditions. The second column (2) lists Existing With Project traffic conditions. The third column (3) shows the increase in ICU value due to the added peak-hour project trips and indicates whether the traffic associated with the project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

Table 3.16-10 indicates that traffic associated with the proposed project will not significantly impact any of the 10 key study intersections when compared with the LOS standards and significant impact criteria specified in this report. Although the intersections of Cannon Street/Serrano Avenue and Cannon Street/Taft Avenue are forecast to operate at unacceptable LOS E during the AM and/or PM peak hours with the addition of project traffic, the proposed project is expected to add less than 0.010 to the ICU value. The remaining eight key study intersections and proposed project driveway are forecast to operate at acceptable levels of service during the AM and PM peak hours with the addition of project-generated traffic to existing traffic.

Roadway Segments
Modified Existing Traffic Conditions
Table 3.16-11 summarizes the roadway segment level of service results at the 17 key roadway segments for Modified Existing traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS “E” capacity. The fourth column (4) presents a summary of existing daily traffic conditions. The fifth column (5) lists Modified Existing daily traffic conditions, which includes trips generated by the existing entitled land use.

Table 3.16-11 indicates that one (1) of the 17 key roadway segments is forecast to operate at an unacceptable level of service under Modified Existing traffic conditions. Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) is forecast to operate at unacceptable LOS
F under Modified Existing traffic conditions. The remaining 16 key roadway segments are forecast to operate at an acceptable service level under Modified Existing traffic conditions.

**Existing With Project Traffic Conditions**

Table 3.16-12 summarizes the roadway segment level of service results at the 17 key roadway segments for Existing With Project traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification and the third column (3) shows the existing LOS “E” capacity. The fourth column (4) presents a summary of Modified Existing daily traffic conditions. The fifth column (5) lists Existing With Project daily traffic conditions. Column (5) also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

Table 3.16-12 indicates that traffic associated with the proposed project will not significantly impact any of the 17 key roadway segments, when compared with the LOS standards and significant impact criteria specified in this report. Although Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) is forecast to operate at unacceptable LOS F with the addition of project traffic, the proposed project is expected to add less than 0.010 to the V/C ratio. The remaining 16 key roadway segments currently operate and are forecast to continue to operate at an acceptable service level with the addition of project generated traffic to existing traffic.
**Table 3.16-10: Existing With Project Peak-Hour Intersection Capacity Analysis**

<table>
<thead>
<tr>
<th>Key Intersections</th>
<th>Time Period</th>
<th>Minimum Acceptable LOS</th>
<th>(1) Modified Existing Traffic Conditions</th>
<th>(2) Existing With Project Traffic Conditions</th>
<th>(3) Project Significant Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ICU</td>
<td>LOS</td>
<td>ICU</td>
</tr>
<tr>
<td>1 Cannon St at Serrano Ave</td>
<td>AM</td>
<td>D</td>
<td>0.847</td>
<td>D</td>
<td>0.847</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.912</td>
<td>E</td>
<td>0.912</td>
</tr>
<tr>
<td>2 Cannon St at Taft Ave</td>
<td>AM</td>
<td>D</td>
<td>0.983</td>
<td>E</td>
<td>0.984</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.869</td>
<td>D</td>
<td>0.870</td>
</tr>
<tr>
<td>3 Hewes St at Villa Park Rd</td>
<td>AM</td>
<td>D</td>
<td>0.748</td>
<td>C</td>
<td>0.748</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.630</td>
<td>B</td>
<td>0.636</td>
</tr>
<tr>
<td>4 Cannon St at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.755</td>
<td>C</td>
<td>0.756</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.743</td>
<td>C</td>
<td>0.748</td>
</tr>
<tr>
<td>5 Orange Park Blvd at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.841</td>
<td>D</td>
<td>0.846</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.883</td>
<td>D</td>
<td>0.894</td>
</tr>
<tr>
<td>6 Meads Ave at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.787</td>
<td>C</td>
<td>0.794</td>
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<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.769</td>
<td>C</td>
<td>0.779</td>
</tr>
<tr>
<td>7 Newport Blvd at Santiago Canyon Rd</td>
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<td>0.770</td>
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<td>D</td>
<td>0.644</td>
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<td>B</td>
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</tr>
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<td>9 Jamboree Rd at Chapman Ave/Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.535</td>
<td>A</td>
<td>0.540</td>
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<td>PM</td>
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<td>0.848</td>
<td>D</td>
<td>0.864</td>
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<td>D</td>
<td>0.418</td>
<td>A</td>
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<td>A</td>
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<tr>
<td>Project Driveway—Nicky Way/Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>—</td>
<td>—</td>
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<td>PM</td>
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<td>0.834</td>
</tr>
</tbody>
</table>

**Note:**
A significant impact would occur if the project causes ICU to increase by 0.010 or more.

# Table 3.16-11: Modified Existing Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Existing Traffic Conditions</th>
<th>(5) Modified Existing Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Daily Volume</td>
<td>V/C Ratio</td>
<td>LOS</td>
</tr>
<tr>
<td>A  Cannon St north of Serrano Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>20,171</td>
<td>0.538 A</td>
</tr>
<tr>
<td>B  Cannon St between Serrano Ave and Taft Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>39,787</td>
<td>1.061 F</td>
</tr>
<tr>
<td>C  Cannon St between Taft Ave and Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>31,799</td>
<td>0.848 D</td>
</tr>
<tr>
<td>D  Cannon St south of Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>8,940</td>
<td>0.238 A</td>
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<tr>
<td>E  Villa Park Rd west of Hewes St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>24,423</td>
<td>0.651 B</td>
</tr>
<tr>
<td>F  Hewes St south of Villa Park Rd</td>
<td>4U</td>
<td>Secondary Arterial</td>
<td>24,000</td>
<td>8,807</td>
<td>0.367 A</td>
</tr>
<tr>
<td>G  Santiago Canyon Rd between Hewes St and Cannon St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,118</td>
<td>0.696 B</td>
</tr>
<tr>
<td>H  Santiago Canyon Rd between Nicky Way and Orange Park Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>29,009</td>
<td>0.774 C</td>
</tr>
<tr>
<td>I  Santiago Canyon Rd between Orange Park Blvd and Meads Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,936</td>
<td>0.718 C</td>
</tr>
<tr>
<td>J  Santiago Canyon Rd between Meads Ave and Newport Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,303</td>
<td>0.701 C</td>
</tr>
<tr>
<td>K  Santiago Canyon Rd between Newport Blvd and Jamboree Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,861</td>
<td>0.371 A</td>
</tr>
<tr>
<td>L  Jamboree Rd between Santiago Canyon Rd and Chapman Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,820</td>
<td>0.370 A</td>
</tr>
<tr>
<td>M  Jamboree Rd south of Chapman Ave/ Santiago Canyon Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,533</td>
<td>0.365 A</td>
</tr>
<tr>
<td>N  Santiago Canyon Rd east of Jamboree Rd</td>
<td>4D</td>
<td>Major Arterial</td>
<td>37,500</td>
<td>22,526</td>
<td>0.601 B</td>
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</table>
### Table 3.16-11 (cont.): Modified Existing Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Existing Traffic Conditions</th>
<th>(5) Modified Existing Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>O Chapman Avenue between Cannon Street and Orange Park Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>19,482</td>
<td>19,482</td>
</tr>
<tr>
<td>P Chapman Avenue between Orange Park Boulevard and Newport Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>23,154</td>
<td>23,154</td>
</tr>
<tr>
<td>Q Orange Park Boulevard between Santiago Canyon Road and Chapman Avenue</td>
<td>2D</td>
<td>Collector</td>
<td>12,000</td>
<td>4,311</td>
<td>4,311</td>
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</table>

Note:
A significant impact would occur if the project causes V/C to increase by 0.010 or more.

### Table 3.16-12: Existing With Project Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Modified Existing Traffic Conditions</th>
<th>(5) Existing With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cannon St north of Serrano Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>20,171</td>
<td>20,225</td>
</tr>
<tr>
<td>B Cannon St between Serrano Ave and Taft Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>39,787</td>
<td>39,857</td>
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<tr>
<td>C Cannon St between Taft Ave and Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>31,799</td>
<td>31,880</td>
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<tr>
<td>D Cannon St south of Santiago Canyon Rd</td>
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<td>37,500</td>
<td>8,940</td>
<td>8,978</td>
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## Table 3.16-12 (cont.): Existing With Project Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Modified Existing Traffic Conditions</th>
<th>(5) Existing With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<tr>
<td>of Hewes St</td>
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<td>24,000</td>
<td>8,807</td>
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<td>Hewes St south of</td>
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</tr>
<tr>
<td>Villa Park Rd</td>
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<td></td>
<td>37,500</td>
<td>26,564</td>
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<td>Santiago Canyon Rd</td>
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<tr>
<td>between Hewes St</td>
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<tr>
<td>and Cannon St</td>
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<td>between Nicky Way</td>
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<tr>
<td>and Orange Park</td>
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<td>Blvd</td>
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<td>between Orange</td>
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<td>Meads Ave</td>
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<td></td>
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<td>J</td>
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<td></td>
<td>37,500</td>
<td>26,543</td>
<td>0.708</td>
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<td>Santiago Canyon Rd</td>
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<td></td>
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<tr>
<td>between Meads Ave</td>
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</tr>
<tr>
<td>between Newport</td>
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<td></td>
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<td>Blvd and Jamboree</td>
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<tr>
<td>Rd</td>
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<td>Major Arterial</td>
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<td>21,060</td>
<td>0.374</td>
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<td>Jamboree Rd between</td>
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<td></td>
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<tr>
<td>Santiago Canyon Rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Chapman Ave</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td></td>
<td>Major Arterial</td>
<td>56,300</td>
<td>20,533</td>
<td>0.365</td>
</tr>
<tr>
<td>Jamboree Rd south</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of Chapman Ave/</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santiago Canyon Rd</td>
<td></td>
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<tr>
<td>N</td>
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<td>Major Arterial</td>
<td>37,500</td>
<td>22,766</td>
<td>0.607</td>
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<td>Santiago Canyon Rd</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>east of Jamboree</td>
<td></td>
<td>Major Arterial</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rd</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O</td>
<td></td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>19,482</td>
<td>0.520</td>
</tr>
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</table>
### Table 3.16-12 (cont.): Existing With Project Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Modified Existing Traffic Conditions</th>
<th>(5) Existing With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>P Chapman Avenue between Orange Park Boulevard and Newport Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>23,154</td>
<td>0.617</td>
</tr>
<tr>
<td>Q Orange Park Boulevard between Santiago Canyon Road and Chapman Avenue</td>
<td>2D</td>
<td>Collector</td>
<td>12,000</td>
<td>4,311</td>
<td>0.359</td>
</tr>
</tbody>
</table>

Note: A significant impact would occur if the project causes V/C to increase by 0.010 or more.
Level of Significance Before Mitigation
Less than significant impact.

Mitigation Measures
No mitigation is necessary.

Level of Significance After Mitigation
Less than significant impact.

Year 2022 Traffic

<table>
<thead>
<tr>
<th>Impact TRANS-2:</th>
<th>The project may conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Year 2022 Traffic Conditions.</th>
</tr>
</thead>
</table>

Impact Analysis
This impact evaluates Year 2022 Traffic Conditions.

Intersections
Table 3.16-13 summarizes the peak-hour level of service results at the 10 key study intersections for Year 2022 traffic conditions. The first column (1) of ICU/LOS values in Table 3.16-13 presents a summary of Modified Existing AM and PM peak-hour traffic conditions. The second column (2) lists projected cumulative traffic conditions (existing plus ambient traffic plus cumulative project traffic) based on existing intersection geometry, but without any traffic generated from the proposed project. The third column (3) presents forecast Year 2022 near-term traffic conditions with the addition of project traffic. The fourth column (4) shows the increase in ICU value due to the added peak-hour project trips and indicates whether the traffic associated with the project will have a significant impact based on the LOS standards and significant impact criteria defined in this report. The fifth column (5) presents the resultant level of service with the inclusion of recommended traffic improvements, where needed, to achieve an acceptable level of service.

Year 2022 Without Project Traffic Conditions
An analysis of future (Year 2022) cumulative traffic conditions indicates that the addition of ambient traffic growth and cumulative project traffic will adversely impact three of the 10 key study intersections. The remaining seven key study intersections are forecast to continue to operate at acceptable levels of service during the AM and PM peak hours with the addition of ambient traffic growth and cumulative project traffic.

It should be noted that the intersection of Jamboree Road at Chapman Avenue/Santiago Canyon Road will be improved to include a second westbound right-turn lane in conjunction with the proposed Santiago Hills II Project.

Year 2022 With Project Traffic Conditions
Table 3.16-13 indicates that traffic associated with the proposed project will significantly impact three of the 10 key study intersections, when compared with the LOS standards and significant...
impact criteria specified in this report. Although the intersections of Cannon Street/Serrano Avenue, Cannon Street/Taft Avenue are forecast to operate at unacceptable LOS E or LOS F during the AM and/or PM peak hours with the addition of project traffic, the proposed project is expected to add less than 0.010 to the ICU value. The remaining seven key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2022. The intersection of Orange Park Boulevard/Santiago Canyon Road would be significantly impacted by the proposed project in Year 2022.

As shown in Table 3.16-13, the implementation of improvements at the impacted key study intersections completely offsets the impact of project traffic and the key study intersections are forecast to operate at an acceptable LOS during the AM and PM peak hours.

**Roadway Segments**

Table 3.16-14 summarizes the roadway segment level of service results at the 17 key roadway segments for Year 2022 traffic conditions. The first column (1) shows the number of lanes, the second column (2) shows the arterial classification, and the third column (3) shows the existing LOS “E” capacity. The fourth column (4) presents a summary of projected Year 2022 cumulative daily traffic conditions. The fifth column (5) lists Year 2022 With Project daily traffic conditions. Column (5) also shows the increase in V/C ratio value due to the added daily project trips and indicates whether the traffic associated with the project will have a significant impact based on the LOS standards and significant impact criteria defined in this report.

**Year 2022 Without Project Traffic Conditions**

An analysis of future (Year 2022) cumulative traffic conditions indicates that with the addition of ambient traffic growth and cumulative project traffic, two of the 17 key roadway segments are forecast to operate at unacceptable levels of service. Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) and Roadway Segment C (Cannon Street between Taft Avenue and Santiago Canyon Road) are forecast to operate at unacceptable LOS E and/or LOS F in the Year 2022. The remaining 15 key roadway segments are forecast to continue to operate at acceptable levels of service with the addition of ambient traffic growth and cumulative projects traffic.

**Year 2022 With Project Traffic Conditions**

Table 3.16-14 indicates that traffic associated with the proposed project will not significantly impact any of the 17 key roadway segments, when compared with the LOS standards and significant impact criteria specified in this report. Although Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) and Roadway Segment C (Cannon Street between Taft Avenue and Santiago Canyon Road) are forecast to operate at unacceptable LOS E and/or LOS F in the Year 2022 with the addition of project traffic, the proposed project is expected to add less than 0.010 to the V/C ratio. The remaining 15 key roadway segments are forecast to continue to operate at an acceptable service level with the addition of project generated traffic in the Year 2022 traffic condition.
### Table 3.16-13: Year 2022 Peak-Hour Intersection Capacity Analysis

<table>
<thead>
<tr>
<th>Key Intersections</th>
<th>Time Period</th>
<th>Minimum Acceptable LOS</th>
<th>(1) Modified Existing Traffic Conditions</th>
<th>(2) Year 2022 Without Project Traffic Conditions</th>
<th>(3) Year 2022 With Project Traffic Conditions</th>
<th>(4) Project Significant Impact</th>
<th>(5) Year 2022 With Project With Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannon St at Serrano Ave</td>
<td>AM</td>
<td>D</td>
<td>0.847</td>
<td>D</td>
<td>0.891</td>
<td>D</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.912</td>
<td>E</td>
<td>0.955</td>
<td>E</td>
<td>0.000</td>
</tr>
<tr>
<td>Cannon St at Taft Ave</td>
<td>AM</td>
<td>D</td>
<td>0.983</td>
<td>E</td>
<td>1.034</td>
<td>F</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.869</td>
<td>D</td>
<td>0.914</td>
<td>E</td>
<td>0.001</td>
</tr>
<tr>
<td>Hewes St at Villa Park Rd</td>
<td>AM</td>
<td>D</td>
<td>0.748</td>
<td>C</td>
<td>0.792</td>
<td>C</td>
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<td></td>
<td>PM</td>
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<td>0.630</td>
<td>B</td>
<td>0.680</td>
<td>B</td>
<td>0.006</td>
</tr>
<tr>
<td>Cannon St at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.755</td>
<td>C</td>
<td>0.796</td>
<td>C</td>
<td>0.001</td>
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<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.743</td>
<td>C</td>
<td>0.792</td>
<td>C</td>
<td>0.005</td>
</tr>
<tr>
<td>Orange Park Blvd at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.841</td>
<td>D</td>
<td>0.890</td>
<td>D</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.883</td>
<td>D</td>
<td>0.937</td>
<td>E</td>
<td>0.011</td>
</tr>
<tr>
<td>Meads Ave at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.787</td>
<td>C</td>
<td>0.833</td>
<td>D</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.769</td>
<td>C</td>
<td>0.816</td>
<td>D</td>
<td>0.010</td>
</tr>
<tr>
<td>Newport Blvd at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.770</td>
<td>C</td>
<td>0.815</td>
<td>D</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.834</td>
<td>D</td>
<td>0.885</td>
<td>D</td>
<td>0.010</td>
</tr>
<tr>
<td>Jamboree Rd at Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.644</td>
<td>B</td>
<td>0.683</td>
<td>B</td>
<td>0.006</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.648</td>
<td>B</td>
<td>0.691</td>
<td>B</td>
<td>0.009</td>
</tr>
<tr>
<td>Jamboree Rd at Chapman Ave/Santiago Canyon Rd</td>
<td>AM</td>
<td>D</td>
<td>0.535</td>
<td>A</td>
<td>0.590</td>
<td>A</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.848</td>
<td>D</td>
<td>0.771</td>
<td>C</td>
<td>0.006</td>
</tr>
<tr>
<td>Orange Park Boulevard/Chapman Avenue</td>
<td>AM</td>
<td>D</td>
<td>0.418</td>
<td>A</td>
<td>0.456</td>
<td>A</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>0.530</td>
<td>A</td>
<td>0.577</td>
<td>A</td>
<td>0.001</td>
</tr>
<tr>
<td>Project Driveway—Nicky Way/Santiago Canyon Road</td>
<td>AM</td>
<td>D</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.837</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>0.888</td>
<td>—</td>
</tr>
</tbody>
</table>

Note:
A significant impact would occur if the project causes ICU to increase by 0.010 or more.
### Table 3.16-14: Year 2022 Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Year 2022 Without Project Traffic Conditions</th>
<th>(5) Year 2022 With Project Traffic Conditions</th>
<th>Sign. Imp. (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cannon St north of Serrano Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>21,698</td>
<td>0.579</td>
<td>A</td>
</tr>
<tr>
<td>B Cannon St between Serrano Ave and Taft Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>42,297</td>
<td>1.128</td>
<td>F</td>
</tr>
<tr>
<td>C Cannon St between Taft Ave and Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>33,917</td>
<td>0.904</td>
<td>E</td>
</tr>
<tr>
<td>D Cannon St south of Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>9,394</td>
<td>0.251</td>
<td>A</td>
</tr>
<tr>
<td>E Villa Park Rd west of Hewes St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>27,028</td>
<td>0.721</td>
<td>C</td>
</tr>
<tr>
<td>F Hewes St south of Villa Park Rd</td>
<td>4U</td>
<td>Secondary Arterial</td>
<td>24,000</td>
<td>9,372</td>
<td>0.391</td>
<td>A</td>
</tr>
<tr>
<td>G Santiago Canyon Rd between Hewes St and Cannon St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>28,803</td>
<td>0.768</td>
<td>C</td>
</tr>
<tr>
<td>H Santiago Canyon Rd between Nicky Way and Orange Park Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>32,058</td>
<td>0.855</td>
<td>D</td>
</tr>
<tr>
<td>I Santiago Canyon Rd between Orange Park Blvd and Meads Ave</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>29,830</td>
<td>0.795</td>
<td>C</td>
</tr>
<tr>
<td>J Santiago Canyon Rd between Meads Ave and Newport Blvd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>29,165</td>
<td>0.778</td>
<td>C</td>
</tr>
</tbody>
</table>
### Table 3.16-14 (cont.): Year 2022 Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Existing Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Existing Capacity at LOS “E”</th>
<th>(4) Year 2022 Without Project Traffic Conditions</th>
<th>(5) Year 2022 With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>23,451</td>
<td>0.417</td>
</tr>
<tr>
<td>L</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>23,408</td>
<td>0.416</td>
</tr>
<tr>
<td>M</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>21,562</td>
<td>0.383</td>
</tr>
<tr>
<td>N</td>
<td>4D</td>
<td>Major Arterial</td>
<td>37,500</td>
<td>29,540</td>
<td>0.788</td>
</tr>
<tr>
<td>O</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>22,711</td>
<td>0.606</td>
</tr>
<tr>
<td>P</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>26,806</td>
<td>0.715</td>
</tr>
<tr>
<td>Q</td>
<td>2D</td>
<td>Collector</td>
<td>12,000</td>
<td>4,774</td>
<td>0.398</td>
</tr>
</tbody>
</table>

Note:
A significant impact would occur if the project causes V/C to increase by 0.010 or more.
To mitigate the proposed project’s impacts at Orange Park Boulevard/Santiago Canyon Road, Mitigation Measure TRANS-2 and TRANS-2b are proposed that would require improvements to each intersection. The improvements are depicted in Exhibit 3.16-23. Because the project contributes to pre-existing deficient conditions, it is only required to mitigate for its fair share of the impact. The fair share calculations are summarized in Table 3.16-15.

**Table 3.16-15: Year 2022 Project Fair Share Contribution**

<table>
<thead>
<tr>
<th>Key Intersection</th>
<th>Impacted Time Period</th>
<th>(1) Project Only Volume</th>
<th>(2) Existing Volume</th>
<th>(3) Year 2022 With Project Volume</th>
<th>(4) Project Fair Share Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Orange Park Blvd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>52</td>
<td>3,447</td>
<td>3,806</td>
<td>14.5%</td>
</tr>
</tbody>
</table>

Notes:
Net Project Percent Increase (4) = Column (1)/[Column (3)–Column (2)]
Bold Project Fair Share Responsibility is based on worst-case scenario.

**Level of Significance Before Mitigation**
Potentially significant impact.

**Mitigation Measures**

MM TRANS-2 Prior to issuance of building permits, the project applicant shall provide the City of Orange with fair share fees to restripe the northbound approach of Orange Park Boulevard at Santiago Canyon Road to provide one exclusive left-turn lane and one shared left-turn/right-turn lane. The applicant’s fair share responsibility for these improvements is 14.5 percent.

**Level of Significance After Mitigation**
Less than significant impact.

**Year 2040 Traffic**

Impact TRANS-3: The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system under Year 2040 Traffic Conditions.

**Impact Analysis**
The following summarizes the “Year 2040 Buildout With Project” level of service results for the 10 key study intersections and 17 key roadway segments. Consistent with the Santiago Hills II Traffic Study, prepared by Stantec Consulting Services Inc., the level of service results for the key study intersections and key roadway segments include improvements planned by the City of Orange. In addition, the circulation network utilized in the Year 2040 analysis reflects the buildout of the City of Orange Master Plan of Arterial Highways (MPAH) that was approved as part of the 2010 City of Orange General Plan Update.
**Planned Improvements**

The following improvements are included in the Year 2040 Buildout traffic analysis and reflect the City’s MPAH. It should be noted that the improvements listed below are consistent with those contained in the Santiago Hills II Traffic Study, prepared by Stantec Consulting Services Inc., dated May 6, 2016. Exhibit 3.16-24 depicts planned improvements to the roadway network.

- Cannon Street at Serrano Avenue: Widen and/or restripe Cannon Street to provide a third southbound through lane.
- Cannon Street at Taft Avenue: Widen and/or restripe Cannon Street to provide a third northbound through lane and a third southbound through lane.
- Cannon Street at Santiago Canyon Road: Widen and/or restripe Cannon Street to provide a second northbound left-turn lane. Widen and/or restripe the southbound approach of Cannon Street to provide three southbound left-turn lanes, three southbound through lanes and a southbound free right-turn lane. Widen and/or restripe Santiago Canyon Road to provide a third eastbound through lane and an exclusive eastbound right-turn lane. Widen and/or restripe Santiago Canyon Road to provide a second westbound left-turn lane and a third westbound through lane.
- Orange Park Boulevard at Santiago Canyon Road: Widen and/or restripe Santiago Canyon Road to provide a third eastbound through lane and a third westbound through lane.
- Meads Avenue at Santiago Canyon Road: Widen and/or restripe Santiago Canyon Road to provide a third eastbound through lane and a third westbound through lane.
- Newport Boulevard at Santiago Canyon Road: Widen and/or restripe Santiago Canyon Road to provide a third eastbound through lane and a third westbound through lane.
- Jamboree Road at Chapman Avenue/Santiago Canyon Road: Widen and/or restripe Santiago Canyon Road to provide a second westbound right-turn lane.
- Project Driveway/Nicky Way at Santiago Canyon Road: Widen and/or restripe Santiago Canyon Road to provide a third eastbound through lane and a third westbound through lane.

**Intersections**

Table 3.16-16 summarizes the peak-hour level of service results at the 10 key study intersections for Year 2040 Buildout traffic conditions. The structure of this table is similar to the near-term (Year 2022) capacity analysis summary presented in Table 3.16-13.

**Year 2040 Buildout Without Project Traffic Conditions**

Table 3.16-16 shows that projected Year 2040 buildout without project traffic will adversely impact two of the 10 key study intersections. The remaining eight key study intersections are forecast to operate at an acceptable LOS under Year 2040 buildout without project traffic conditions.

**Year 2040 Buildout With Project Traffic Conditions**

Table 3.16-16 indicates that traffic associated with the proposed project will not significantly impact any of the 10 key study intersections when compared with the LOS standards and significant impact
criteria specified in this report. Although the intersections of Cannon Street/Serrano Avenue and Jamboree Road/Chapman Avenue-Santiago Canyon Road are forecast to operate at unacceptable LOS E and/or LOS F during the AM and/or PM peak hours with the addition of project traffic, the proposed project is expected to add less than 0.010 to the ICU value. The remaining eight key study intersections are forecast to continue to operate at an acceptable LOS with the addition of project generated traffic in the Year 2040.

**Roadway Segments**
Table 3.16-17 summarizes the roadway segment level of service results at the 17 key roadway segments for Year 2040 traffic conditions. The structure of this table is similar to the Year 2022 daily capacity analysis summary presented in Table 3.16-14.

**Year 2040 Buildout Without Project Traffic Conditions**
An analysis of future (Year 2040) buildout traffic conditions indicates that two of the 17 key roadway segments are forecast to operate at unacceptable levels of service. Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) and Roadway Segment E (Villa Park Road west of Hewes Street) are forecast to operate at unacceptable LOS E and/or LOS F in the Year 2040. The remaining 15 key roadway segments are forecast to continue to operate at acceptable levels of service in the Year 2040.

**Year 2040 With Project Traffic Conditions**
Table 3.16-17 indicates that traffic associated with the proposed project will not significantly impact any of the 17 key roadway segments, when compared with the LOS standards and significant impact criteria specified in this report. Although Roadway Segment B (Cannon Street between Serrano Avenue and Taft Avenue) and Roadway Segment E (Villa Park Road west of Hewes Street) are forecast to operate at unacceptable LOS E and/or LOS F in the Year 2040 with the addition of project traffic, the proposed project is expected to add less than 0.010 to the V/C ratio. The remaining 15 key roadway segments are forecast to continue to operate at an acceptable service level with the addition of project generated traffic in the Year 2040 traffic condition.
Exhibit 3.16-24
Year 2040 Planned Improvements

Source: Linscott, Law & Greenspan, Engineers 2017
Table 3.16-16: Year 2040 Buildout Peak-Hour Intersection Capacity Analysis

<table>
<thead>
<tr>
<th>Key Intersections</th>
<th>Time Period</th>
<th>Minimum Acceptable LOS</th>
<th>(1) Modified Existing Traffic Conditions</th>
<th>(2) Year 2040 Buildout Without Project Traffic Conditions</th>
<th>(3) Year 2040 Buildout With Project Traffic Conditions</th>
<th>(4) Project Significant Impact</th>
<th>(5) Year 2040 Buildout With Project With Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Cannon St at Serrano Ave</td>
<td>AM PM</td>
<td>D</td>
<td>0.847</td>
<td>0.912</td>
<td>0.960</td>
<td>E</td>
<td>1.314</td>
</tr>
<tr>
<td>2 Cannon St at Taft Ave</td>
<td>AM PM</td>
<td>D</td>
<td>0.983</td>
<td>0.869</td>
<td>0.872</td>
<td>D</td>
<td>0.879</td>
</tr>
<tr>
<td>3 Hewes St at Villa Park Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.748</td>
<td>0.630</td>
<td>0.634</td>
<td>B</td>
<td>0.826</td>
</tr>
<tr>
<td>4 Cannon St at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.755</td>
<td>0.743</td>
<td>0.832</td>
<td>D</td>
<td>0.856</td>
</tr>
<tr>
<td>5 Orange Park Blvd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.841</td>
<td>0.883</td>
<td>0.790</td>
<td>C</td>
<td>0.755</td>
</tr>
<tr>
<td>6 Meads Ave at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.787</td>
<td>0.769</td>
<td>0.630</td>
<td>C</td>
<td>0.638</td>
</tr>
<tr>
<td>7 Newport Blvd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.770</td>
<td>0.834</td>
<td>0.880</td>
<td>D</td>
<td>0.845</td>
</tr>
<tr>
<td>8 Jamboree Rd at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.644</td>
<td>0.648</td>
<td>0.790</td>
<td>B</td>
<td>0.844</td>
</tr>
<tr>
<td>9 Jamboree Rd at Chapman Ave/Santiago Canyon Rd</td>
<td>AM PM</td>
<td>D</td>
<td>0.535</td>
<td>0.848</td>
<td>0.748</td>
<td>A</td>
<td>0.911</td>
</tr>
<tr>
<td>10 Orange Park Blvd at Chapman Avenue</td>
<td>AM PM</td>
<td>D</td>
<td>0.418</td>
<td>0.530</td>
<td>0.561</td>
<td>A</td>
<td>0.718</td>
</tr>
<tr>
<td>— Project Driveway—Nicky Way at Santiago Canyon Road</td>
<td>AM PM</td>
<td>D</td>
<td>—</td>
<td>—</td>
<td>0.636</td>
<td>B</td>
<td>—</td>
</tr>
</tbody>
</table>

Note:
A significant impact would occur if the project causes ICU to increase by 0.010 or more.
### Table 3.16-17: Year 2040 Buildout Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Future Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Future Capacity at LOS “E”</th>
<th>(4) Year 2040 Buildout Without Project Traffic Conditions</th>
<th>(5) Year 2040 Buildout With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Cannon St north of Serrano Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>30,705</td>
<td>0.545</td>
</tr>
<tr>
<td>B Cannon St between Serrano Ave and Taft Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>60,564</td>
<td>1.076</td>
</tr>
<tr>
<td>C Cannon St between Taft Ave and Santiago Canyon Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>48,405</td>
<td>0.860</td>
</tr>
<tr>
<td>D Cannon St south of Santiago Canyon Rd</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>9,864</td>
<td>0.263</td>
</tr>
<tr>
<td>E Villa Park Rd west of Hewes St</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>37,275</td>
<td>0.994</td>
</tr>
<tr>
<td>F Hewes St south of Villa Park Rd</td>
<td>4U</td>
<td>Secondary Arterial</td>
<td>24,000</td>
<td>10,605</td>
<td>0.442</td>
</tr>
<tr>
<td>G Santiago Canyon Rd between Hewes St and Cannon St</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>38,430</td>
<td>0.683</td>
</tr>
<tr>
<td>H Santiago Canyon Rd between Nicky Way and Orange Park Blvd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>47,565</td>
<td>0.845</td>
</tr>
<tr>
<td>I Santiago Canyon Rd between Orange Park Blvd and Meads Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>41,773</td>
<td>0.742</td>
</tr>
<tr>
<td>J Santiago Canyon Rd between Meads Ave and Newport Blvd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>40,005</td>
<td>0.711</td>
</tr>
<tr>
<td>K Santiago Canyon Rd between Newport Blvd and Jamboree Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>28,140</td>
<td>0.500</td>
</tr>
<tr>
<td>L Jamboree Rd between Santiago Canyon Rd and Chapman Ave</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>28,560</td>
<td>0.507</td>
</tr>
</tbody>
</table>
### Table 3.16-17 (cont.): Year 2040 Buildout Roadway Segment Level of Service Summary

<table>
<thead>
<tr>
<th>Key Roadway Segment</th>
<th>(1) No. of Future Lanes</th>
<th>(2) Arterial Classification</th>
<th>(3) Future Capacity at LOS “E”</th>
<th>(4) Year 2040 Buildout Without Project Traffic Conditions</th>
<th>(5) Year 2040 Buildout With Project Traffic Conditions</th>
<th>Sign. Imp. (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N Santiago Canyon Rd east of Jamboree Rd</td>
<td>6D</td>
<td>Major Arterial</td>
<td>56,300</td>
<td>Daily Volume: 36,750, V/C Ratio: 0.653, LOS: B</td>
<td>Daily Volume: 36,940, V/C Ratio: 0.656, LOS: B</td>
<td>0.003, No</td>
</tr>
<tr>
<td>O Chapman Avenue between Cannon Street and Orange Park Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>Daily Volume: 30,975, V/C Ratio: 0.826, LOS: D</td>
<td>Daily Volume: 30,975, V/C Ratio: 0.826, LOS: D</td>
<td>0.000, No</td>
</tr>
<tr>
<td>P Chapman Avenue between Orange Park Boulevard and Newport Boulevard</td>
<td>4D</td>
<td>Primary Arterial</td>
<td>37,500</td>
<td>Daily Volume: 26,670, V/C Ratio: 0.711, LOS: C</td>
<td>Daily Volume: 26,697, V/C Ratio: 0.712, LOS: C</td>
<td>0.001, No</td>
</tr>
<tr>
<td>Q Orange Park Boulevard between Santiago Canyon Road and Chapman Avenue</td>
<td>2D</td>
<td>Collector</td>
<td>12,000</td>
<td>Daily Volume: 5,909, V/C Ratio: 0.492, LOS: A</td>
<td>Daily Volume: 5,936, V/C Ratio: 0.495, LOS: A</td>
<td>0.003, No</td>
</tr>
</tbody>
</table>

**Note:**
A significant impact would occur if the project causes V/C to increase by 0.010 or more.

**Level of Significance Before Mitigation**
Less than significant impact.

**Mitigation Measures**
No mitigation is necessary.

**Level of Significance After Mitigation**
Less than significant impact.

**Congestion Management Program**

| Impact TRANS-4: | The project would not 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**
Santiago Canyon Road is a facility that is identified in the Orange County Congestion Management Program. As discussed in Impacts TRANS-1 through TRANS-3, the proposed project can mitigate all of its impacts associated with deficient traffic conditions on Santiago Canyon Road. Thus, no conflicts with the Congestion Management Plan would occur. 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.

**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**
Linscott, Law, & Greenspan evaluated the proposed access point on Santiago Canyon Road for safety and operational efficiency. The results are summarized as follows.

**Site Access Evaluation**
Access to the proposed project will be provided via one proposed full-access signalized driveway, located directly opposite Nicky Way, along Santiago Canyon Road. An internal network of roadways would provide vehicular access to each individual dwelling unit.
Table 3.16-18 summarizes the intersection operations at the proposed project driveway for Existing, Near-Term (Year 2022), and Buildout (Year 2040) traffic conditions at completion and full occupancy of the proposed project. Review of Table 3.16-18 shows that the proposed project driveway is forecast to operate at acceptable LOS D or better during the AM and PM peak hours for Existing plus Project, Year 2022 plus Project and Year 2040 plus Project traffic conditions. As such, project access will be adequate. Motorists entering and exiting the project site will be able to do so comfortably, safely, and without undue congestion.

Appendix D presents the existing plus project, Year 2022 plus project and Year 2040 plus project level of service calculation worksheets for the proposed project driveway.

Table 3.16-18: Project Driveway Peak-Hour Levels of Service Summary

<table>
<thead>
<tr>
<th>Project Driveway</th>
<th>Time Period</th>
<th>Intersection Control</th>
<th>Existing With Project Traffic Conditions</th>
<th>Year 2022 With Project Traffic Conditions</th>
<th>Year 2040 With Project Traffic Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Driveway/Nicky Way at Santiago Canyon Rd</td>
<td>AM PM</td>
<td>5∅ Traffic Signal</td>
<td>0.791 ICU C LOS D</td>
<td>0.837 ICU D LOS D</td>
<td>0.636 ICU B LOS B</td>
</tr>
</tbody>
</table>

Note:
∅ = phase

Mitigation Measure TRANS-5 requires the applicant to improve the intersection of E. Santiago Canyon Road/Nicky Way—Project Driveway to allow for safe and efficient access to the proposed project prior to the issuance of the first certificate of occupancy. With the implementation of mitigation, impacts would be less than significant.

Level of Significance Before Mitigation
Potentially significant impact

Mitigation Measures

MM TRANS-5 Prior to issuance of the first certificate of occupancy, the City of Orange shall verify that the applicant has improved the intersection of E. Santiago Canyon Road/Nicky Way—Project Driveway as follows:

- Construct the north leg of the intersection and provide one inbound lane and two outbound lanes (i.e., one dedicated left turn lane and one shared through/right-turn lane).
- A five-phase signal has been installed with protected left-turn phasing in the east-west direction and permissive phasing in the north-south direction.
- The Project Driveway provides one inbound lane and one outbound lane (shared left/through/right).
• E. Santiago Canyon Road has been widened or restriped to provide one eastbound left-turn lane and westbound right-turn lane to allow for turning movements into the Project Driveway.

**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**
The proposed project would take vehicular access from Santiago Canyon Road via a full-access signalized driveway aligned with Nicky Way. All internal roadways would comply with applicable Fire Code requirements, including those that pertain to access for large emergency vehicles. Additionally, the proposed project would not modify any surrounding roadways in a manner that could impair emergency response or evacuation (road closures, lane narrowing, etc.). Therefore, adequate emergency access would be provided. 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 Alternative Transportation**

**Impact TRANS-7:** The project would not 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**
This impact will address conflicts with alternative transportation, including public transit, bicycles, and pedestrians.

**Public Transit**
The closest OCTA bus stop is located approximately 2 miles from the project site at Santiago Canyon College. At the time of this writing, there are no plans to introduce bus service to the segments of Santiago Canyon Road or Cannon Street that abut the project site. Furthermore, the proposed project does not have any features that preclude or otherwise impede bus service should it be proposed in the future. Impacts would be less than significant.
Bicycles and Pedestrians

The Class I Santiago Creek Bike Path follows the Santiago Creek corridor before terminating at Cannon Street. The proposed project would extend the trail through the project site to Santiago Oaks Regional Park. This would close a gap in the regional bicycle and pedestrian network.

Additionally, the Santiago Creek Trail along the north bank of Santiago Creek within the project site would remain unchanged. Furthermore, a network of trails would be developed within the project site that would provide linkages between the aforementioned trails and street frontages.

Class II bicycle lanes currently exist along the segments of Santiago Canyon Road or Cannon Street that abut the project site, and these facilities would be maintained by the proposed project.

An off-street recreational trail would be installed along the project frontage with Santiago Canyon Road and connect to an internal network of pedestrian facilities within the residential portion of the project site. The existing sidewalk along the Cannon Street frontage would be maintained.

Note that there are no existing sidewalks along the Villa Park Landfill frontage with either Santiago Canyon Road or Cannon Street. The landfill is owned by the County of Orange, and, therefore, the applicant does not have the legal ability to install sidewalks along its street frontage. As such, this existing condition would remain unchanged. 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.
3.17 - Tribal Cultural Resources

3.17.1 - 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. The review presents the methods employed to identify TCRs, assesses potential impacts to those resources, and presents recommendations to address potential impacts.

3.17.2 - 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

Prehistory

The ultimate purpose of establishing a cultural sequence is to allow for the meaningful comparison of material culture attributes on an intra- and inter-site basis, and to provide the basis for culture-model building. To this end, regional archaeologists generally follow Wallace’s Southern California Format (1955 and 1978) for discussing the prehistoric chronology for the project area. However, the established chronologies are often augmented or even abandoned. For example, Fagan (2003) does not use the traditional archaeological cultural sequences for his regional analysis, instead he described the stages as generalized models related to recent environmental change and socio-economic models, all associated with an ever-changing environment. Thusly, it should be noted that all of the presented cultural sequences are regularly challenged, as are the meanings of the individual frames of reference. Wallace’s prehistoric format is as follows:

- Early Period (before 6000 B.C.)
- Milling Stone (6000 to 3000 B.C.)
- Intermediate (3000 B.C. to A.D. 500)
- Late Prehistoric (A.D. 500 to A.D. 1769).
Wallace also argued (Wallace, in Heizer 1978) that the stages prior to 2000 B.C. in southern California could be assigned to:

- San Dieguito Period (Period I: 9000 to 6000 B.C.)
- Standard Millingstone Period (Period II: 6000 to 3000 B.C.)

Warren (1968) uses the following terms to subdivide the periods:

- San Dieguito Tradition (Before 5500 B.C.)
- Encinitas Tradition (5500 B.C. to A.D. 600)
- Shoshonean Tradition (A.D. 600 to A.D. 1769)

The Late Period has been further subdivided into the San Luis Rey I (A.D. 500 to A.D. 1500) and the San Luis Rey II (post 1500). The difference between the latter two is the introduction of locally made brownware pottery, the first indigenous pottery in southern California (Cameron 1999).

**Early Period (before 6000 B.C.)**

Beginning with the first human presence in California, prehistoric artifacts and cultural activities appear to represent a big-game hunting tradition. Very few sites from the Early Period exist, especially in inland areas. Of the Early Period sites that have been excavated and dated, most exhibit a refuse assemblage suggesting short-term occupation. Such sites have been detected in caves and around fluvial lakes fed by streams that existed near the end of the last glaciation. Chipped stone tools at these sites are surmised to reflect a specialized tool kit used by hunters. Large-stemmed bifaces are common. Millingstones and dart points are not part of the Early Period tool assemblage.

**Millingstone Period (6000 to 3000 B.C.)**

The onset of the Millingstone Period appears to correspond with an interval of warm and dry weather known as the Altithermal (Wallace 1978). Artifact assemblages begin to reflect an emphasis on plant foods and foraging subsistence systems, as evidenced by the grinding tools found at these sites, and including choppers and scraper planes. Notably, there is a reduced number of large bifaces in the excavated assemblages. Sites are occupied for a greater duration than Early Period sites, based on an increase in occupational debris. Although numerous Millingstone sites have been identified in Orange County, few are actually dated. The best understood of these is CA-ORA-64, which has been radiometrically dated to about 6000 B.C. (Breece et al. 1988 and 1989). Excavations at this site located near Newport Bay, have been essential to the formulation of local research models (Koerper 1981). Research at this site suggests a settlement-subsistence system during the Millingstone Period reflecting a semi-sedentary lifestyle. The regional distribution of Millingstone sites reflects the theory that aboriginal groups may have followed a modified central-based wandering settlement pattern. Under this model, large groups would have occupied a base camp for a portion of the year, with smaller bands occupying subsidiary camps in order to exploit resources not generally available near the base camp. Sedentism apparently increased in areas possessing an abundance of resources that were available for longer periods. Arid inland regions would have provided a seasonally and spatially dispersed resource base, restricting sedentary occupation, compared to the coastal areas. Generally, the Millingstone assemblage in the Los Angeles basin is
typified by large and heavy deep-basin metates, wedge-shaped manos and large choppers and scrapers. Flaked lithic tools are slightly larger and cruder than in later periods, and cogstones begin to appear.

**Intermediate Period (3000 B.C. to A.D. 500)**

Dating between roughly 3000 B.C. and A.D. 500, the Intermediate Period represents a slow technological transition, which is presumably related to the slowly drying and warming climate. Site artifact assemblages retain many attributes of the Millingstone Period. Technologically speaking, these sites are difficult to distinguish from earlier sites in the absence of radiometric dates.

Additionally, these sites generally contain a reduced number of large-stemmed or notched projectile points but with an increase in portable mortars and pestles. The lack of large points combined with the mortars and pestles suggest that the indigenous populations may have preferred harvesting, processing, and consuming acorns and other seeds over hunting. Because of a general lack of data, neither the settlement and subsistence systems nor the cultural evolution of this period is well understood. It has been proposed by some researchers that group sedentarism increased with the exploitation of storable, high-yield plant food resources such as acorns. The duration and intensity of occupation at base camps increased during this period, especially in the later part of the period.

Generally, the Intermediate Period artifact assemblage in the Los Angeles basin is vague, including elements of the Late Prehistoric Period and Millingstone Period, such as heavy grinding implements.

A higher percentage of projectile points occur and smaller chipped stone tools are used.

**Late Prehistoric Period (A.D. 500 to A.D. 1769)**

Extending from about A.D. 500 to Spanish contact in A.D. 1769, the Late Prehistoric Period reflects an increased sophistication and diversity in technology. Village sites are common. Late assemblages characteristically contain small projectile or dart points, which imply the use of the bow and arrow.

In addition, assemblages include steatite bowls, asphaltum artifacts, grave goods, and elaborate shell ornaments. Use of bedrock milling stations is purported to have been widespread during this period, as it was in the previous period. Increased hunting efficiency and widespread exploitation of acorns provided reliable and storable food resources. Pottery, previously traded into the area, is made locally during the latest stage of this Period and is of simple construction technology.

Cameron (1999) names several village sites in inland Orange County that are located within Gabrieliño territory. These exhibited pottery, which suggests that the pre-contact Gabrieliño may have used pottery as a part of their lifestyle. One of these Late Prehistoric Period sites, Tomato Springs (CA-Ora-244), has been the subject of numerous excavations (Cottrell 1985) that have continued into the 21st century.

**Native American Background**

The project area is situated within an area that has been ethnographically mapped as the Gabrieliño traditional use area. The Gabrieliño tribal territory is mapped as extending north from Aliso Creek to just beyond the Topanga Canyon along the Pacific Coast, and inland to the City of San Bernardino.
Their territory would have included portions of the Santa Ana River, and several islands, and diffusion of ideas between neighboring groups, such as the Juaneño to the south.

**The Gabrieliño**

Kroeber (1925) and Bean and Smith (1978) form the primary historical references for this tribal group. The arrival of Spanish explorers and the establishment of missions and outposts during the eighteenth century ended the prehistoric period in California. At this time, traditional Gabrieliño society began to fragment as a result of foreign diseases and the mass removal of local Indian groups to the Mission San Gabriel and Mission San Juan Capistrano. The Gabrieliño spoke a language that belongs to the Cupan group of the Takic subfamily of the Uto-Aztecan language family (a language family that includes the Shoshonean groups of the Great Basin). The total Gabrieliño population in about 1770 AD was roughly 5,000 persons, based on an estimate of 100 small villages, with approximately 50 to 200 people per village. Their range is generally thought to have been located along the Pacific coast from Malibu to San Pedro Bay, south to Aliso Creek, then east to Temescal Canyon, then north to the headwaters of the San Gabriel River. Also included were several islands, including Catalina. This large area encompasses the City of Los Angeles, much of Rancho Cucamonga, Corona, Glendale, and Long Beach. By 1800, most traditional Gabrieliños had either been killed, or subjugated by the Spanish. The first modern social analyses of Gabrieliño culture took place in the early part of the twentieth century (Kroeber 1925). By this time, acculturation and disease had devastated this group, and the population studied was a remnant of their pre-contact form. Nonetheless, the early ethnographers viewed the Gabrieliño as a chief-oriented society of semi-sedentary hunter-gatherers. Influenced by coastal and interior environmental settings, their material culture was quite elaborate and consisted of well-made wood, bone, stone, and shell items. Included among these was a hunting stick made to bring down numerous types of game. Located in an area of extreme environmental diversity, large villages may have been permanent, such as that found on or near Red Hill in Rancho Cucamonga, with satellite villages utilized seasonally. Their living structures were large, domed, and circular thatched rooms that may have housed multiple families. The society exhibited ranked individuals, possibly chiefs, who possessed a much higher level of economic power than unranked persons.

**Historic Background**

**City of Orange**

The earliest European explorers to enter the Alta California region were the Spanish who navigated along the Pacific coast during the 17th and 18th centuries. During the latter portion of the 18th century, the Spanish sent Father Junipero Serra to Alta California to create a chain of Missions and Mission outposts to bring Christianity to the indigenous population, and create a foundation for colonization of the region. Between 1769 and 1823, Spanish explorers and missionaries established 21 missions, four presidios, and four pueblos between San Diego and Sonoma. Also during this period, American explorations occurred when trappers traveled west in search of abundant sea otter and beaver pelts. In 1805, when Lewis and Clark crossed the Rocky Mountains and continued on to the Pacific coast, they reported that the area was richer in beaver and otter than any other country on earth. The fur trappers were close behind the explorers, and by 1840, the beaver was over-exploited and was no longer worth hunting (Bean and Rawls 1983).
By the early decades of the 19th century, the Missions began establishing ranchos for the purpose of expanding their agricultural holdings. According to the history provided on the City of Orange website, the first landowner in this area was a retired Spanish soldier named Juan Pablo Grijalva. Grijalva was granted permission to ranch “the place of the Arroyo de Santiago” by the Spanish colonial government in 1801. This land ran from the Santa Ana River and the foothills above Villa Park, to the sea at Newport Beach. Though Grijalva lived in San Diego, he built an adobe ranch house on what is now Hoyt Hill, at the corner of Hewes and Santiago Canyon Road (City of Orange History 2008).

Following Grijalva’s death, the rancho was taken over by his son-in-law, Jose Antonio Yorba, and grandson, Juan Pablo Peralta. These lands then became known as the Rancho Santiago de Santa Ana, and were granted to Yorba and Peralta on July 1, 1810. This 75,000-acre grant was made by Governor Arrellaga, and encompassed the majority of the Santa Ana Canyon of eastern Orange County, as well as much of northern Orange County and Newport Bay (Lech 2004). The children and grandchildren of Yorba and Peralta moved to various parts of the sizable rancho, and through time, the descendants absorbed additional acreage. The family holdings eventually encompassed lands extending from Riverside to the ocean.

In the early 1860s, Leonardo Cota, an extended family member, borrowed money from the largest landowner in southern California. Abel Stearns lent Cota money, and held his share of the Rancho as collateral. When Cota defaulted on his loan in 1866, Stearns filed a lawsuit in the Los Angeles Superior Court to demand a partition of the land, in order to claim Cota’s section. It took two years to determine how much land was due to each family member, and the rancho was then divided into 1,000 units for the heirs and the claimants in the lawsuit (City of Orange 2008).

The Los Angeles attorneys involved in the lawsuit, Alfred Chapman and Andrew Glassell, received a portion of the Rancho Santiago de Santa Ana as payment for their services. They quickly subdivided their land into a 1-square-mile town, with surrounding 10-acre farm lots. This community was named Richland until 1873, when the town’s application for a post office was denied due to the existence of another Richland in Sacramento County. According to local legend, Richland was renamed Orange after a poker game where Glassell, Chapman, and two other men allowed the winner to decide the new town name. Though the winner is not recorded, Richland was named Orange in January of 1875.

By 1873 Richland/Orange was beginning to grow by opening the first local store, named Fisher Brothers, a civic organization, called the Orange Grange, and the first church, which was of the Methodist Episcopal denomination. This was also the year that local farmers began planting orange groves in the area. The area then continued to grow when the Southern Pacific Railroad built a depot in Orange, in 1880, and again with the arrival of the Santa Fe railroad in 1887.

During the land boom of the 1880s, Orange attracted many travelers, founded local newspapers, build a public library, a bank and incorporation occurred on April 6, 1888. When the boom ended, local farmers continued to plant orange trees. By 1929, Orange County produced more than $12 million from the sale of oranges. However, with the depression and inclement weather in the 1930s, the industry fell into economic decline (City of Orange 2008).
By the 1950s, a second real estate boom occurred, and large tracts of houses were constructed into the 1970s. Thereafter the City of Orange continued to grow at a steady pace, and development is still occurring, especially at the eastern edge of the city.

**Historic Era Aerial Photograph**

FCS (formerly MBA) additionally conducted a historic era aerial photograph review, from an image taken from the National Imagery Program for Orange County. This photograph was taken on December 12, 1952. During the historic era, the project area was part of an extensive sand and gravel mining operation, which began in approximately 1952 (LSA 1992). This process removed sand and gravel from alluvial deposits, and then processed the sediments in an open area located to the south of Santiago Creek. Evidence of the surface mining activity is observable in this photograph in the central portion of the project area, to the south of Santiago Creek. In this area, there is an absence of vegetation, multiple piles of soil, and numerous dirt tracks and/or unimproved access roads. Santiago Creek borders the surface mining area to the north, and numerous citrus groves are found to the southeast, south, and southwest along Santiago Canyon Road. In the southwestern corner of the project area, to the north of Santiago Canyon Road, and at the southern terminus of a windrow of eucalyptus trees is a clearing with apparent structures. These structures are situated between citrus groves, and appear to coincide with the location of a concrete foundation and an asphalt and concrete lot recorded during the pedestrian survey as Site 001. Additional citrus groves are found within the project area boundaries, to the north of Santiago Creek. These citrus groves appear to cover the recorded location of prehistoric-age site CA-Ora-369, which was detected during the cultural resources literature search at the South Central Coastal Information Center (SCCIC).

**3.17.3 - 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 Senate Bill (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.

3.17.4 - Methodology

NAHC Sacred Lands File Record Search and Tribal Consultation

On October 6, 2008, FCS sent a letter to the NAHC in an effort to determine whether any sacred sites are listed in its Sacred Lands File for this portion of the City of Orange. FCS's efforts were associated with CEQA-level information scoping only. The response from the NAHC was received on October 10, 2008. To ensure that all potential Native American resources are adequately addressed, letters to each of the 12 listed tribal contacts were sent on November 3, 2008. FCS received an emailed response from John Tommy Rosas, the Tribal Administrator for the Tongva Ancestral Territorial Tribal Nation on November 3, 2008. Mr. Rosas indicated that the Tribe objected to the project, and that development in that area violated their indigenous rights. He cited the project location along Santiago Creek as an especially sensitive issue. Further, he noted the need for additional consultation efforts as required by law, including Section 106 of the National Historic Preservation Act (NHPA) and SB 18. He also requested additional information on the proposed project. FCS Project Archaeologist Jennifer M. Sanka replied to this email, providing additional information on the Conceptual Development Plan and asking for any information that could be included in the Cultural Resources Assessment regarding the sanctity of Santiago Creek. This information was requested, as FCS was aware that Santiago Creek and adjacent environs would be considered a culturally sensitive area to local Tribes. This assumption is based upon the presence of numerous prehistoric-age sites along the Creek and a known reliance on its resources by the indigenous people as outlined in ethnographic studies.

Updated Native American Consultation

An updated Native American Consultation for the Rio Santiago Project was prepared by BCR Consulting, dated May 12, 2011. Subsequently, on March 3, 2017, the City contacted three tribes pursuant to AB 52. Each tribe was notified in writing of the proposed project and invited to consult with the City. The letters were sent via certified mail; to date, the City has not received any responses.

Pedestrian Survey

A pedestrian survey was conducted on the property on December 1, 2017. The property appeared to be in the same condition as described in the 2008 survey report. Most of the property has been heavily impacted from sand and gravel activities. In the northernmost section of the property, immediately south of Mabury Street, is a relatively narrow strip of heavily vegetated land. It is in that general area where CA-ORA-369 was originally recorded and ultimately tested and found
ineligible for the CRHR. An intensive effort was made to see if any remains of the site were present. None were observed. The 2008 investigation recorded an old concrete foundation and adjacent asphalt and gravel lot. The site was not indicated on the topographic records search map at the SCCIC, and no record of the site is on file with SCCIC. This is likely the fenced lot access via Jamestown off Santiago. However, at the time of its recordation, it was deemed insignificant and no further work was recommended.

3.17.5 - 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.

3.17.6 - 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.

Eligibility for California Register Listing

| 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

On July 1, 2015, an amendment to Public Resources Code 21074 took effect, which created a new category of cultural resources: “Tribal Cultural Resources.” These resources are defined as:

- Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:
  - Included or determined to be eligible for inclusion in the California Register of Historical Resources (Analyzed in Impact TCR-1).
  - Included in a local register of historical resources.
• A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant (Analyzed in Impact TCR-2).

The project site is not listed on any national, state, or local registers of historic places (including those for tribal cultural resources). Additionally, no tribal cultural resources were observed during the field survey. Because the project site contains undeveloped land, it does not possess any attributes that would make it eligible for such a listing. 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.

**Eligibility as Determined by Lead Agency**

<table>
<thead>
<tr>
<th>Impact TCR-2</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**Impact Analysis**
The City of Orange sent a letter to the following tribes in March 2017 notifying them of the proposed project and advising that any tribal consultation request should be made within 30 days:

• San Gabriel Band of Mission Indians
• Torres Martinez Desert Cahuilla Indians
• Gabrieleno Band of Mission Indians

To date, the City of Orange has not received a tribal consultation request from any of the tribes and, therefore, there is no basis for the City to conclude that the project site supports tribal cultural resources. 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.
3.18 - Utilities and Service Systems

3.18.1 - Introduction
This section describes the utilities and service systems setting and potential effects from project implementation on the site and its surrounding area. Descriptions and analysis in this section are based on information provided in the Preliminary Hydrology and Hydraulic Report prepared by Fuscoe Engineering, which is provided as Appendix G. Additional information was provided by the City of Orange website, the City of Orange 2015 Urban Water Management Plan, the Orange County Sanitation District website, the California Department of Resources Recovery and Recycling website, the Edison International (Southern California Edison) 10-K Annual Report, and the Sempra Energy (SoCalGas) 10-K Annual Report.

3.18.2 - Environmental Setting

Potable Water
The City of Orange Water Division provides potable water service to 36,347 customer accounts within the Orange city limits and nearby areas outside the city limits. Approximately 97 percent of customer accounts are within the Orange city limits.

Water System
The City’s water system consists of 15 active groundwater wells, 16 reservoirs (with more than 40 million gallons of storage capacity), 16 pump stations, and 450 miles of pipeline.

Water Supply
The City of Orange obtains potable water from two primary sources (groundwater and imported) that account for 96 percent of supply and an additional source (surface) that accounts for 4 percent of supply. Groundwater is pumped from 15 active wells located throughout the City. Imported water is obtained from Metropolitan Water District (Metropolitan) via Municipal Water District of Orange County (MWDOC) and is delivered to the City through eight water connections. Surface water from Irvine Lake is obtained from Serrano Water District.

The City of Orange 2015 Urban Water Management Plan provides detailed descriptions of groundwater and imported water, which are summarized briefly in the following section. Recycled water is not currently available to the service area, nor is it contemplated to be available in the future by the 2015 Urban Water Management Plan.

Groundwater
Historically, local groundwater has been the cheapest and most reliable source of supply for the City. The City currently relies on approximately 20,623 acre-feet/year of groundwater from the Orange County (OC) Basin.

The OC Basin underlies the northerly half of Orange County beneath broad lowlands. The OC Basin is managed by Orange County Water District (OCWD) and covers an area of approximately 350 square miles, bordered by the Coyote and Chino Hills to the north, the Santa Ana Mountains to the
northeast, and the Pacific Ocean to the southwest. The OC Basin boundary extends to the Orange County-Los Angeles Line to the northwest, where groundwater flows across the county line into the Central Groundwater Basin of Los Angeles County. The total thickness of sedimentary rocks in the OC Basin is over 20,000 feet, with only the upper 2,000 to 4,000 feet containing fresh water. The Pleistocene or younger aquifers comprising this Basin are over 2,000 feet deep and form a complex series of interconnected sand and gravel deposits. The OC Basin’s full volume is approximately 66 million acre-feet.

Groundwater levels are managed within a safe basin operating range to protect the long-term sustainability of the OC Basin and to protect against land subsidence. OCWD regulates groundwater levels in the OC Basin by regulating the annual amount of pumping.

The OC Basin is not adjudicated; as such, pumping from the OC Basin is managed through a process that uses financial incentives to encourage groundwater producers to pump a sustainable amount of water. The framework for the financial incentives is based on establishing the basin production percentage, the percentage of each Producer’s total water supply that comes from groundwater pumped from the OC Basin. Groundwater production at or below the basin production percentage is assessed a Replenishment Assessment. While there is no legal limit as to how much an agency pumps from the OC Basin, there is a financial disincentive to pump above the basin production percentage. Agencies that pump above the basin production percentage are charged the Replenishment Assessment plus the Basin Equity Assessment, which is calculated so that the cost of groundwater production is greater than MWDOC’s full service rate. The Basin Equity Assessment can be increased to discourage production above the basin production percentage. The basin production percentage is set uniformly for all producers by OCWD on an annual basis.

Imported Water

The City supplements its local groundwater with imported water purchased from Metropolitan through MWDOC. Imported water represents approximately 30 percent of the City’s total water supply. Metropolitan’s principal sources of water are the Colorado River via the Colorado River Aqueduct and the Lake Oroville watershed in Northern California through the State Water Project. The raw water obtained from these sources is, for Orange County, treated at the Robert B. Diemer Filtration Plant located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the Metropolitan Lower Feeder and State Water Project water through the Yorba Linda Feeder.

2015 Water Supply

The 2015 Urban Water Management Plan indicated that actual water supplies totaled 28,643 acre-feet in 2015. Table 3.18-1 summarizes the 2015 actual supply sources.

<table>
<thead>
<tr>
<th>Source</th>
<th>Acre-Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>20,372</td>
</tr>
<tr>
<td>Purchased or Imported Water</td>
<td>6,514</td>
</tr>
</tbody>
</table>
Table 3.18-1 (cont.): Actual Water Supply (2015)

<table>
<thead>
<tr>
<th>Source</th>
<th>Acre-Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water</td>
<td>1,757</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28,643</strong></td>
</tr>
</tbody>
</table>

Source: City of Orange, 2016.

Long-Term Water Supply

The 2015 Urban Water Management Plan projects future water supplies and demand through 2040. Table 3.18-2 summarizes the projections.

Table 3.18-2: Long-Term Water Supply Projections

<table>
<thead>
<tr>
<th>Source</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
<th>2035</th>
<th>2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Groundwater</td>
<td>19,600</td>
<td>20,650</td>
<td>20,650</td>
<td>20,650</td>
<td>20,650</td>
</tr>
<tr>
<td>Purchased or Imported Water</td>
<td>7,200</td>
<td>7,650</td>
<td>7,650</td>
<td>7,650</td>
<td>7,650</td>
</tr>
<tr>
<td>Surface</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
<td>1,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>28,000</strong></td>
<td><strong>29,500</strong></td>
<td><strong>29,500</strong></td>
<td><strong>29,500</strong></td>
<td><strong>29,500</strong></td>
</tr>
</tbody>
</table>

Source: City of Orange, 2016.

Wastewater

Wastewater service in the City of Orange is provided by two public agencies: the City of Orange Public Works Department, which provides local collection services; and OCSD, which provides regional collection, treatment, and disposal services.

City of Orange

The City maintains and operates pipeline 315 miles of sewer pipeline. The City discharges effluent into OCSD regional trunk lines.¹

Orange County Sanitation District

OCSD is a public agency that provides wastewater collection, treatment, and disposal services for approximately 2.6 million people within a 479-square-mile service area within central and northwest Orange County. OCSD is a special district that is governed by a Board of Directors consisting of local elected officials from jurisdictions within the service area.

¹ OCSD maintains and operates 386 miles of trunk line in its service area.
**Treatment Plants**

OCSD operates two treatment plants: Plant No. 1 in Fountain Valley and Plant No. 2 in Huntington Beach.

Plant No. 1 provides secondary treatment and has a primary treatment capacity of 198 million gallons per day (mgd) and a secondary treatment capacity of 110 mgd. The plant treats approximately 130 mgd. All of the treated effluent from Plant No. 1 is piped to OCWD for further processing for the Groundwater Replenishment Program, which involves groundwater recharge along the Santa Ana River.

Plant No. 2 provides secondary treatment and has a primary treatment capacity of 168 mgd and a secondary treatment capacity of 90 mgd. The plant treats approximately 100 mgd. All of the treated effluent from Plant No. 2 is discharged into the Pacific Ocean via an outfall consisting of a 10-foot diameter pipeline that extends 5 miles from shore to the point approximately 200 feet below the ocean surface.

**Storm Drainage**

The City of Orange Public Works Department and the Orange County Flood Control District oversee stormwater drainage within the Orange city limits. The municipal storm drainage system consists of an integrated system of curbside gutters, catch basins, drainage ditches, man-made channels, and creeks. Stormwater is managed pursuant to the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit issued on May 22, 2009 (Order No. R8-2009-0030) by the Santa Ana Regional Water Quality Control Board (RWQCB).

The project site is located in the Santiago Creek Watershed, which is tributary to the Santa Ana River. The Handy Creek storm drain operated by the Orange County Flood Control District is located underground in the central portion of the project site. The storm drain enters the project site from the south at the intersection of N. Nicky Way/E. Santiago Canyon Road. The storm drain conveys stormwater collected in areas south of E. Santiago Canyon Road into Santiago Creek. Within the project site, the Handy Creek storm drain accepts runoff from the eastern portion of the site via several inlets. Runoff from other portions sheet flow to Santiago Creek or pond on-site and percolate into the soil.

An unnamed storm drain located in the northwestern portion of the project site conveys stormwater collected in the Mabury Ranch neighborhood directly into Santiago Creek. Note that the project site does not directly discharge runoff into either storm drain.

**Solid Waste**

CR&R Incorporated provides franchise solid waste collection to residential and commercial customers in Orange. Solid waste collected in Orange is transported to the CR Transfer and Material Recovery Facility in Stanton for processing.
**Landfills**

Non-recoverable solid waste from Orange is disposed of at the three landfills listed in Table 3.18-3. As shown in the table, the landfills have 384.7 million cubic yards of combined remaining capacity.

<table>
<thead>
<tr>
<th>Facility</th>
<th>Location</th>
<th>Permitted Daily Throughput (tons)</th>
<th>Permitted Capacity</th>
<th>Remaining Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frank Bowerman Sanitary Landfill</td>
<td>Irvine</td>
<td>11,500</td>
<td>266.0 million</td>
<td>205.0 million</td>
</tr>
<tr>
<td>Olinda Alpha Sanitary Landfill</td>
<td>Brea</td>
<td>8,000</td>
<td>148.8 million</td>
<td>34.2 million</td>
</tr>
<tr>
<td>El Sobrante Landfill</td>
<td>Corona</td>
<td>16,054</td>
<td>184.9 million</td>
<td>145.5 million</td>
</tr>
<tr>
<td><strong>Total Remaining Capacity</strong></td>
<td></td>
<td><strong>384.7 million</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: California Department of Resources Recovery and Recycling, 2016.

**Energy**

Southern California Edison (SCE) provides electrical service and Southern California Gas Company (SoCalGas) provides natural gas service to customers in the City of Orange.

**Electricity**

SCE, a unit of Edison International, provides electricity to approximately 5 million metered customers within a 50,000-square-mile service area of Southern California. SCE obtains electricity from a variety of sources, including its own generation plants and purchased power from outside sources. SCE has an ownership stake in the Palo Verde Nuclear Generating Station (Arizona) and owns the Big Creek Hydroelectric System (Fresno County). SCE purchases electricity from a variety of outside sources, including natural gas, wind, geothermal, solar, and biomass generation facilities. SCE is currently in the process of implementing several major transmission system improvements in its service area to meet the electrical needs of planned growth.

**Natural Gas**

SoCalGas, a unit of Sempra Energy, provides natural gas service to 5.9 million metered customers within an approximately 20,000-square-mile service area located throughout Central and Southern California, excluding San Diego County, Long Beach, and the desert area of San Bernardino County. (The population of the service area is estimated to be 21.6 million.) SoCalGas has interstate pipeline capacity contracts with El Paso Natural Gas Company, Transwestern Pipeline Company, Gas Transmission Northwest, Pacific Gas and Electric Company, and Kern River Gas Transmission Company to supply natural gas. The utility’s system consists of 2,964 miles of transmission and storage pipelines, 49,874 miles of distribution pipelines, and 47,413 miles of service pipelines. SoCalGas operates four underground natural gas storage reservoirs with a combined working capacity of 137 billion cubic feet.
3.18.3 - Regulatory Framework

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 5 years. The act requires that urban water management plans include a description of water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions. Specifically, urban water management plans must:

- Provide current and projected population, climate, and other demographic factors affecting the supplier’s water management planning;
- Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier;
- Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage;
- Describe plans to supplement or replace that source with alternative sources or water demand management measures;
- Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis (associated with systems that use surface water);
- Quantify past and current water use;
- Provide a description of the supplier’s water demand management measures, including schedule of implementation, program to measure effectiveness of measures, and anticipated water demand reductions associated with the measures; and
- Assess the water supply reliability.

Pursuant to the Urban Water Management Planning Act, the City of Orange maintains an Urban Water Management Plan.

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 its review of landscaping plans. Local agencies can either adopt the Model Water Efficient Landscape Ordinance or incorporate provisions of the ordinance into its own 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, effective January 1990. The legislation required each local jurisdiction in
the State to set diversion requirements of 25 percent in 1995 and 50 percent in 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, amendments to the California Integrated Waste Management Act 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.

**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 2013 Building Energy Efficiency Standards (which are updated on an approximately three-year cycle) went into effect on July 1, 2014. The Energy Commission then developed 2016 Standards, which continue to improve upon the 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2016 Standards went into effect on January 1, 2017. 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. Over time, the energy savings will accumulate as the Standards affect each subsequent year of construction. The savings result from changes to both the residential and nonresidential standards. The Standards affect both newly constructed buildings and alterations to existing buildings. These savings result from retrofit insulation requirements for existing roofs and the energy requirement for renovated lighting systems to meet the updated Standards.

**Local**

**City of Orange**

**General Plan**

The City of Orange General Plan sets forth the following goals and policies relevant to utility and service systems:

**Infrastructure Element**

- **Goal 1.0:** Ensure water, sewer, and storm drain systems that meet the needs of residents and businesses.
- **Policy 1.1:** Provide sufficient levels of water, sewer, and storm drain service throughout the community.
• **Policy 1.2:** Correct known deficiencies in the City’s sewer, storm drain, and water systems and work toward environmentally sustainable systems.

• **Policy 1.6:** Require that new developments fund fair-share costs associated with City provision of water, sewer, and storm drain service and are consistent with City and service provider plans to complete needed improvements and funding capacity for such improvements.

• **Goal 2.0:** Reduce the amount of waste material entering regional landfills with an efficient and innovative waste management program.

• **Policy 2.1:** Provide sufficient levels of solid waste service throughout the community.

• **Goal 4.0:** Ensure adequate provision of electricity, natural gas, telephone and data services and cable television.

• **Policy 4.2:** Continue to require utilities to be placed underground for new development.

**Storm Drainage Requirements**

All projects requiring discretionary City approval are required to prepare a Water Quality Management Plan in accordance with the Orange County Drainage Area Master Plan and City of Orange Local Implementation Plan. Chapter 7 of both documents contain information on the types of projects requiring Water Quality Management Plans, which include new development and redevelopment projects in both the private and public sector.

The Water Quality Management Plan is intended to provide information related to the project’s generation and mitigation of water quality pollutants and assessment of hydrological impacts. The Water Quality Management Plan contains project information related to site characteristics, expected pollutants, hydrology impacts, incorporation of structural and non-structural best management practices, Low Impact Development design features, operation and maintenance, and public education and training. The purpose of the Water Quality Management Plan is to minimize water quality impacts to downstream water bodies.

**3.18.4 - Methodology**

FCS reviewed several sources for information about utilities and service systems including the City of Orange website, City of Orange 2015 Urban Water Management Plan, the Orange County Sanitation District website, the California Department of Resources Recovery and Recycling website, the Edison International (SCE) 10-K Annual Report, and Sempra Energy (SoCalGas) 10-K Annual Report.

**3.18.5 - 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?

3.18.6 - Project Impacts and Mitigation Measures

Potable Water

Impact USS-1: 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

The proposed project would be served with potable water provided by the City of Orange. There are two existing water mains located within E. Santiago Canyon Road that measure 18 inches and 24 inches in diameter, respectively.

The proposed project would install a network of underground water lines within the project site that would connect to one or both of the existing water mains within E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit. Using the Average Baseline Per Capital water demand rate set forth in Table 2-9 of the City’s 2015 Urban Water Management Plan, project water demand is estimated in Table 3.18-4. As shown in the table, the proposed project would demand 116 acre-feet on an annual basis.

Table 3.18-4: Estimated Water Demand

<table>
<thead>
<tr>
<th>Dwelling Units</th>
<th>Population</th>
<th>Demand Rate</th>
<th>Water Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>226 gallons/capita/day</td>
<td>104,186 gallons 0.3 acre-foot</td>
</tr>
</tbody>
</table>

Note: Population estimate derived from Table 3.13-3 in Section 3.13, Population and Housing. Source: City of Orange 2016; FirstCarbon Solutions, 2016.

The 2015 Urban Water Management Plan is based on demand between 2020 and 2040 under all water year scenarios being fully met by available supplies (28,000 to 29,500 acre-feet). The demand projections in the 2015 Urban Water Management Plan accounted for future residential development.
on the project site. The Urban Water Management Plan used the previous Rio Santiago application to estimate this usage, and assumed 460 dwelling units consisting of a combination of townhomes and senior units on 30 acres and passive and active recreation and open space on 80 acres.

In summary, the proposed project’s demand is captured in future demand projections set forth in the 2015 Urban Water Management Plan and can be met under all scenarios. Thus, the City would not need to secure additional water supplies to serve the proposed project. 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.

### Wastewater

**Impact USS-2:** The proposed project would be served by a wastewater treatment plant with adequate capacity and would not require the construction of new or expanded facilities.

**Impact Analysis**

The proposed project would be served with wastewater collection and treatment provided by OCSD. There is an existing OCSD trunk sewer main located within E. Santiago Canyon Road that measures 18 inches in diameter.

The proposed project would install a network of underground sewer piping within the project site that would connect to the existing sewer main within E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit. Using OCSD’s single-family residential wastewater generation rate, project wastewater generation is estimated in Table 3.18-5. As shown in the table, the proposed project would generate 0.074 mgd.

<table>
<thead>
<tr>
<th>Single-Family Residential Wastewater Generation Rate</th>
<th>Acres</th>
<th>Daily Wastewater Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,488 gallons/acre/day</td>
<td>50</td>
<td>74,400 gallons (0.074 mgd)</td>
</tr>
</tbody>
</table>

Note:

mgd = million gallons per day
Source: City of Orange 2016; FirstCarbon Solutions, 2016.
OCSD Plant No. 1 has a primary treatment capacity of 198 mgd and Plant No. 2 has a primary treatment capacity of 168 mgd. The proposed project’s daily effluent generation of 0.074 mgd represents less than 0.01 percent of the primary treatment capacity at either plant.

In summary, adequate wastewater collection and treatment would be available to serve the proposed project and new or expanded wastewater facilities would not be necessary. 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 proposed project would result in the development of up to 129 dwelling units and infrastructure on 40.2 acres of the project site. The remaining acreage would be dedicated for open space and recreation use. Thus, the proposed project would increase the amount of impervious surface coverage on the project site, and would create the potential for increased runoff leaving the project site that may create potential flooding conditions in downstream waterways.

Of particular concern is the Handy Creek storm drain, which currently accepts runoff from the project site under existing conditions. The County of Orange has previously identified the storm drain as a deficient flood control facility that is not capable of conveying runoff from a 100-year storm event.

The proposed project would install a network of storm drainage facilities within the project site consisting of inlets, underground piping, and basins. This system would serve 72.58 acres of the site and direct runoff to a 3.7-acre foot capacity stormwater detention basin in the western portion of the site. A flow control structure will be installed within the detention system to meter the outflow from the site to below predevelopment levels. Catch basins will be located at various points within the site to capture subarea flows. The system is designed to detain flows from a 100-year storm event as required by the Orange County Hydrology Manual.

Two sub drainage areas will flow directly to Santiago Creek without detention. One of these areas is approximately 1.46 acres directly over the Handy Creek Channel. This flow will be directed to the Handy Creek Channel. The other area is the trail system adjacent to Santiago Creek and totals 6.20 acres. This flow will be picked up via a storm drain system, which will outlet at the same location as the detention basin outlet. The outlet structure from the detention basin to Santiago Creek will be protected by riprap and an energy dissipater.
As discussed in greater detail in Impact HYD-3 in Section 3.9, Hydrology and Water Quality, the proposed project would achieve net reduction in 2-year and 100-year storm event discharge into Santiago Creek and no net increase in 2-year and 100-year storm event discharge into the Handy Creek storm drain.

This serves to illustrate that the proposed storm drainage system would slow, reduce, and meter the volume of runoff leaving the project site and ensure that downstream storm drainage facilities are not inundated with project-related stormwater. Impacts would be less than significant.

Finally, the proposed project would not alter the two unnamed storm drains located in the northwestern portion of the project site.

**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-4:** The project would be served with adequate landfill capacity and will comply with federal, state, and local statutes and regulations related to solid waste.

**Impact Analysis**
This impact assesses whether the proposed project would be served by a landfill with adequate capacity or comply with federal, state, and local statutes and regulations related to solid waste. Solid waste would be generated by construction and operational activities. Each is discussed below.

**Construction Solid Waste**
Short-term construction waste generation is summarized in Table 3.18-6. The estimate of 1,380 cubic feet was calculated using an average of 4.38 pounds of debris per square foot of residential construction, as provided by the United States Environmental Protection Agency.

**Table 3.18-6: Estimated Construction Waste Generation**

<table>
<thead>
<tr>
<th>Project Square Feet</th>
<th>Construction Waste Generation Rate</th>
<th>Construction Waste Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4.38 pounds/square foot</td>
<td>Tons</td>
</tr>
<tr>
<td>450,000</td>
<td></td>
<td>986</td>
</tr>
</tbody>
</table>

Notes:
Each dwelling unit estimated to be an average of 3,000 square feet
1 ton = 2,000 pounds 1 ton = 1.4 cubic yards
The estimate of 1,380 cubic yards of construction waste would be an extremely small amount (less than 0.01 percent) relative to the remaining capacity at the landfills that serve Orange (384.7 million cubic yards). Therefore, impacts would be less than significant.

**Operational Waste**

Operational solid waste generation for residential uses was calculated using the City of Orange’s residential waste generation figures provided by Cal Recycle. The project’s waste generation calculations are provided in Table 3.18-7. As shown in the table, the proposed project is expected to create 167 cubic yards of waste annually.

<table>
<thead>
<tr>
<th>Dwelling Units</th>
<th>Operational Waste Generation Rate</th>
<th>Operational Waste Generation</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>1,586 pounds/year/dwelling unit</td>
<td>119 Tons 167 Cubic Yards</td>
</tr>
</tbody>
</table>

Notes:
1 ton = 2,000 pounds 1 ton = 1.4 cubic yards
Sources: Cal Recycle, 2015; FirstCarbon Solutions, 2015.

The estimate of 167 cubic yards of operational waste would be an extremely small amount (less than 0.01 percent) relative to the remaining capacity at the landfills that serve Orange (384.7 million cubic yards). Moreover, the proposed project would be served with solid waste and recycling collection services provided by a contracted solid waste hauler. Recoverable materials would be separated from the waste stream either at the project site or at a materials recovery facility in accordance with state and local solid waste regulations. Therefore, solid waste 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.

**Energy**

Impact USS-5: The project would not result in the inefficient, unnecessary, or wasteful use of energy.

**Impact Analysis**

SCE would provide electrical service and the SoCalGas would provide natural gas service to the proposed project.
A network of underground electrical lines would be installed within the project site and connect to existing SCE facilities along E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

A network of underground natural gas lines would be installed within the project site and connect to existing SoCalGas facilities along E. Santiago Canyon Road. Underground service laterals would be extended to each dwelling unit.

Table 3.18-8 provides an estimate of the proposed project’s annual energy consumption. These figures were derived from residential energy consumption rates observed in California. These estimates likely overstate actual consumption, because they include structures located in different climate regions or states with less stringent energy efficiency standards than California.

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Dwelling Units</th>
<th>Consumption Rate</th>
<th>Annual Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>129</td>
<td>6,294 kWh/dwelling unit</td>
<td>944,100 kWh</td>
</tr>
<tr>
<td>Natural Gas</td>
<td></td>
<td>35,000 cubic feet/dwelling unit</td>
<td>5.25 million cubic-feet</td>
</tr>
</tbody>
</table>

Note: kWh = kilowatt hours
Source: FirstCarbon Solutions, 2016.

As shown in the table, the proposed project is estimated to demand 944,100 kWh of electricity and 5.25 million cubic feet of natural gas at buildout on an annual basis. All new non-residential development would be subject to the latest adopted edition of the Title 24 energy efficiency standards, which are among the most stringent in the U.S.

In addition, as outlined within Section 6.4, Energy Conservation of this Draft EIR, 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 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 in Section 6.4, Energy Conservation, this EIR 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.
As such, the proposed project would not result in the unnecessary, wasteful, or inefficient 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 Orange. Table 4-1 provides a list of the other projects considered in the cumulative analysis.

Table 4-1: Cumulative Projects

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Project</th>
<th>Characteristics</th>
<th>Location</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>City of Orange</td>
<td>Salem Lutheran Church Expansion</td>
<td>7,388 square-foot expansion</td>
<td>6500 E. Santiago Canyon Road</td>
<td>Approved; not built</td>
</tr>
<tr>
<td></td>
<td>Arena Site Single-Family Homes</td>
<td>7 single-family homes</td>
<td>6422 E. Santiago Canyon Road</td>
<td>Permitted; not approved</td>
</tr>
<tr>
<td></td>
<td>Santiago Hills II</td>
<td>1,066 single-family homes 114 condominiums 9.4-acre park</td>
<td>E. Santiago Canyon Road/West of State Route 241</td>
<td>Approved; not built</td>
</tr>
<tr>
<td></td>
<td>Olson Project</td>
<td>37 townhomes</td>
<td>Washington Avenue/ S. Hamlin Street</td>
<td>Approved; under construction</td>
</tr>
<tr>
<td></td>
<td>Ridgeline</td>
<td>39 single-family dwelling units</td>
<td>1051 N. Meads Avenue</td>
<td>Rescinded by City Council</td>
</tr>
</tbody>
</table>

Source: City of Orange, 2017.
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 proposed 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 area surrounding the project site. This is the area within view of the project and, therefore, the area most likely to experience changes in visual character or experience light and glare impacts.

Two of the projects listed in Table 4-1 are within view of the project site (Salem Lutheran Church Expansion and Arena Site Single Family Homes). The proposed project consists of the development of 129 dwelling units on 40.2 acres of the site and preservation of the remaining acreage as open space. The project vicinity is characterized by suburban development and open space, including single-family residential uses, the closed Villa Park Landfill, and Santiago Oaks Regional Park. Much of the surrounding project area has been developed within the past 50 years in compliance with the General Plan, and the City’s current municipal code requirements related to design and visual character. Compliance with these standards, as well as the City’s review and approval role in the planning process has ensured a visually compatible and cohesive development pattern in the surrounding area. Therefore, there is currently no existing cumulatively significant visual aesthetic impact within the project area.

As stated previously, two of the projects listed in Table 4-1 are within view of the project site. The project vicinity has existing sources of light and glare. All new light fixtures associated with the project would be subject to the provisions of the Orange Municipal Code, which requires that new lighting must be directed, controlled, screened, or shaded in such a manner as not to shine directly on surrounding premises. As such, no significant change in light and glare levels would occur as a result of the proposed project. Other projects that involve the installation of new exterior lighting fixtures would be required to implement similar devices to prevent light spillage.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact relating to aesthetics, light, and glare.
4.2.2 - Agriculture Resources and Forest Resources

There are no agricultural or forestry resources within the project site or on surrounding land uses. This condition precludes the possibility of the proposed project contributing to a cumulative impact in this regard. No impacts would occur.

4.2.3 - Air Quality

The geographic scope of the cumulative greenhouse gas emissions analysis is the South Coast Air Basin, which encompasses Orange County, Los Angeles County (excluding the Antelope Valley), Ventura County, Riverside County (excluding the Coachella Valley and the desert region) and San Bernardino County (excluding the desert region). 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.

All of the projects listed in Table 4-1 would result in new air emissions, during construction or operations (or both). The air basin is currently in non-attainment of the federal standards for ozone, PM$_{10}$ and PM$_{2.5}$, and is in nonattainment of the state standards for ozone and PM$_{2.5}$. Therefore, there is an existing cumulatively significant air quality impact with respect to these pollutants.

The proposed project would emit construction and operational criteria pollutant emissions at levels that would exceed the South Coast Air Quality Management District (SCAQMD) thresholds. Mitigation is proposed requiring the implementation of criteria pollutant emissions (i.e., ozone precursors) reduction measures and would serve to reduce construction and operational emissions to below SCAQMD thresholds. Thus, the proposed project would not have a cumulatively considerable contribution to criterial pollutant emissions.

As discussed in Section 3.3, Air Quality, cumulative cancer, non-cancer chronic and acute health impacts, and PM$_{2.5}$ concentrations were evaluated at the most impacted off-site sensitive receptor from all sources of toxic air contaminant (TAC) emissions located within 1,000 feet of the project site. The project’s individual contribution to cancer risk for all phases is below the SCAQMD’s 10 in a million threshold for individual project impacts; therefore, the project would not result in a cumulatively considerable contribution to the existing, cumulatively significant TAC cancer risk.

All other project-related air quality impacts were found to be less than significant and did not require mitigation. Other projects that result in similar impacts would be required to mitigate for their impacts. Because the proposed project can mitigate all of these remaining air quality impacts to a level of less than significant, it would not have a related cumulatively significant impact with respect to these impact areas.

4.2.4 - Biological Resources

The geographic scope of the cumulative biological resources analysis is the region surrounding the project site. The project site is located in an area characterized by urban development and infrastructure; accordingly, habitats in these areas tend to be characterized as highly disturbed, and impacts would be localized. Recent development patterns and anticipated future growth in the
Orange region is considered an existing cumulatively significant impact to biological resources due to the loss of potential habitat for rare species.

The proposed project has the potential to have a significant impact on the least Bell's vireo and nesting birds. Mitigation Measures BIO-2a through BIO-2d are proposed requiring pre-construction surveys for these species and implementation of protection measures if they are found to be present. Some of the other projects listed in Table 4-1 are located on sites with similar biological attributes and, therefore, would be required to mitigate for impacts on special-status wildlife species in a manner similar to the proposed project. The required mitigation would reduce the project’s contribution to any significant cumulative impact on special-status wildlife species to less than cumulatively considerable.

The proposed project has the potential to have a significant impact on sensitive riparian communities and wetlands. Mitigation Measures BIO-3 and BIO-4 are proposed requiring restoration or replacement of disturbed features. Some of the other projects listed in Table 4-1 are located on sites with similar biological attributes and, therefore, would be required to mitigate for impacts on sensitive riparian communities and wetlands. The required mitigation would reduce the project’s contribution to any significant cumulative impact on sensitive riparian communities and wetlands to less than cumulatively considerable.

All other project-related biological resource impacts (e.g., wildlife movement, conservation plans) were found to be less than significant and did not require mitigation. Other projects that result in similar impacts would be required to mitigate for their impacts. Because the proposed project’s impact on all of these remaining biological resources is less than significant, it would not have a cumulatively considerable contribution to any existing significant cumulative impact.

4.2.5 - 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).

Construction activities associated with development projects in the project vicinity may have the potential to encounter undiscovered cultural resources. These projects would be required to mitigate for impacts through compliance with applicable federal and state laws governing cultural resources. Even if a significant cumulative impact could be found, the proposed project would not make a cumulatively considerable impact with required mitigation. The likelihood of any significant cultural resources on the project site are very low given the developed nature of the site, previous disruptions to its ground and the lack of any known resource within its boundaries. Although there is the possibility that previously undiscovered resources could be encountered by subsurface earthwork activities, 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. Given the low potential for disruption, and the comprehensiveness of mitigation measures that would apply to this project and those in the vicinity, the proposed project would not make a cumulatively considerable contribution to any potentially significant cumulative impact on cultural resources.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to cultural resources.

4.2.6 - Geology and Soils

The geographic scope of the cumulative geology, soils, and seismicity analysis is the project vicinity. 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 project activities (generally within a 0.25-mile radius). Development in the project vicinity has not included any uses or activities which would result in geology, soils or seismicity impacts (such as mining or other extraction activities), and there is no existing cumulatively significant impact.

Development projects in the project vicinity may have the potential to be exposed to seismic hazards. However, there is a less than significant potential of the projects in combination to expose people or structure 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. Some or all of the other projects listed in Table 4-1 would be exposed to similar seismic hazards and, therefore, would be expected to implement similar regulatory requirements and mitigation measures. As such, the proposed project, in conjunction with other projects, would not have a cumulatively significant impact associated with seismic hazards.

Regarding soil erosion, development activities could lead to increased erosion rates on-site soils, which could cause unstable ground surfaces and increased sedimentation in nearby streams and drainage channels. Mitigation Measure HYD-1a requires implementation of standard stormwater pollution prevention measures to ensure that earthwork activities do not result in substantial erosion off-site. This mitigation, in turn, would have to comply with the National Pollution Discharge Elimination System (NPDES) stormwater permitting program, which regulates water quality originating from construction sites. The NPDES program, which governs projects statewide (and nationwide), requires the preparation and implementation of Stormwater Pollution Prevention Programs for construction activities that disturb more than 1 acre, and the implementation of Best Management Practices that ensure the reduction of pollutants during stormwater discharges, as well as compliance with all applicable water quality requirements. Since the proposed project would have to comply with federal and state regulations and required mitigation measures that are designed to minimize impacts to projects on a wide geographic scale, the project’s contribution to any significant cumulative erosion impact would be less than cumulatively considerable.

Finally, the project site contains fill soils that that may not be suitable to support urban development. Standard grading and soil engineering practices would abate these issues. Some or all of the other projects listed in Table 4-1 would be exposed to expansive soil hazards or unstable geologic units and, therefore, would be expected to implement similar grading and soil engineering
practices to address those impacts. The proposed project would not contribute to any significant cumulative impact due to expansive soils or unstable soil units.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to geology, soils, and seismicity, assuming compliance with regulatory requirements.

4.2.7 - Greenhouse Gas Emissions

The geographic scope of the cumulative greenhouse gas emissions analysis is the South Coast Air Basin, which encompasses Orange County, Los Angeles County (excluding the Antelope Valley), Ventura County, Riverside County (excluding the Coachella Valley and the desert region) and San Bernardino County (excluding the desert region). 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.

Greenhouse gas emissions are inherently cumulative in nature, and the appropriate scope of analysis is the global climate. The proposed project and other projects would emit new greenhouse gas emissions. The proposed project’s greenhouse gas emissions would not exceed the SCAQMD threshold of 3,500 metric tons of carbon dioxide equivalents after implementation of mitigation measures and project design features. Therefore, the project’s contribution of greenhouse gas emissions would not be cumulatively significant.

4.2.8 - Hazards and Hazardous Materials

The geographic scope of the cumulative hazards and hazardous materials analysis is the project area. Adverse effects of hazards and hazardous materials tend to be localized; therefore, the area near the project area 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 project vicinity that are known to utilize large quantities of hazardous materials or involve hazardous activities, and there is no existing cumulatively significant impact.

The project site is adjacent to the closed Villa Park Landfill and previously supported uses that involved regular petroleum usage. Thus, the proposed would implement mitigation for vapor intrusion and remediation of petroleum-impacted soils. Other projects listed in Table 4-1 that have become contaminated from past uses or possess characteristics that involve the routine handling of large quantities of hazardous materials, would be required to mitigate for their impacts. Because hazards and hazardous materials exposure is generally localized and development activities associated with the other projects listed in Table 4-1 may not coincide with the proposed project, this effectively precludes the possibility of cumulative exposure.

The project site is adjacent to Santiago Oaks Regional Park and contains the wooded Santiago Creek Corridor. Thus, it is susceptible to wildland fires and would need to provide adequate emergency access. The proposed project would be required to prepare and implement a fuel modification plan and comply with all applicable Fire Code requirements for emergency access. Other projects listed in Table 4-1 that are susceptible to wildland fires would be required to implement similar mitigation.
Because wildland fire exposure is dependent on location and development activities associated with the other projects listed in Table 4-1 may not occur in areas susceptible to such hazards, this effectively precludes the possibility of cumulative exposure.

Because the proposed project’s impact due to hazards and hazardous materials is less than significant, it would not have a cumulatively considerable contribution to any significant cumulative impact.

4.2.9 - Hydrology and Water Quality

The geographic scope of the cumulative hydrology and water quality analysis is the project vicinity, generally areas within 0.5 mile of the project site for stormwater impacts due to natural drainage patterns, drainage infrastructure, and impervious surfaces, which all contribute to limit the distance of stormwater flows. Hydrologic and water quality impacts tend to be localized; therefore, the area near the project site would be most affected by project activities. The nature and types of surrounding development, existing stormwater infrastructure and regulatory requirements have ensured that no cumulatively significant impacts related to water pollutants or flooding exist within the project vicinity.

The proposed project would involve short-term construction and long-term operational activities that would have the potential to degrade water quality in downstream water bodies. Mitigation Measures HYD-1a and HYD-1b are proposed that would require implementation of various construction and operational water quality control measures to prevent the release of pollutants into downstream waterways. Other projects that propose new development are required to implement similar mitigation measures in accordance with adopted regulations. The required mitigation would reduce the project’s contribution to any significant cumulative water quality impact to less than cumulatively considerable.

The project site is within the dam failure inundation area of Villa Park Dam and Santiago Dam. Mitigation Measure HYD-5 is proposed requiring the applicant to implement an Emergency Evacuation Plan that identifies procedures for an orderly evacuation of the project in the event indications of failure occur at either facility. Other projects that are within the dam failure inundation area would be required to comply with applicable emergency evacuation regulations. The required mitigation would reduce the project’s contribution to any significant cumulative dam failure impact to less than cumulatively considerable.

All other project-related hydrology impacts (e.g., groundwater, drainage and 100-year flood hazards) were found to be less than significant and do not require mitigation. Because all project-related hydrology impacts are less than significant, the project would not have a cumulatively considerable contribution to any significant cumulative impact for these impacts.

4.2.10 - Land Use and Planning

The geographic scope of the cumulative land use analysis is the Orange area. Land use decisions are made at the city level; therefore, the Orange area is an appropriate geographic scope. Development within Orange is governed by the City’s General Plan and the Municipal 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. As a result, there is no existing cumulatively significant land use impact.

The project site is currently designated for LDR, RA, and OS by the General Plan and zoned S-G and R-1-8. The proposed project involves the development of up to 129 dwelling units on 40.2 acres within the area designated RA and the preservation of the remaining 69 acres (which overlap with the RA and LDR designations) as open space and recreation uses. Accordingly, the applicant is proposing to change the RA designation to a combination of LDR and OS; and the LDR designation to OS. Thus, the proposed land use changes would serve to relocate the residential use and replace the resource use with open space use, which was found to be a less than significant impact.

Development projects in the Orange area would continue to be required to demonstrate consistency with all applicable City of Orange General Plan and Municipal Code requirements. This would ensure that these projects comply with applicable planning regulations. Those projects listed in Table 4-1 that have been previously approved have been deemed consistent with all applicable General Plan and Specific Plan requirements. For pending projects, the lead agency would be required to issue findings demonstrating consistency with the applicable General Plan and Municipal Code requirements if they are ultimately approved.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to land use.

4.2.11 - Mineral Resources

The geographic scope of the cumulative mineral resource analysis is Orange County-Temescal Valley Region, which encompasses Orange County and western Riverside County. This region was defined by the California State Mining and Geology Board for the purposes of identifying mineral resource zones.

The Orange County-Temescal Valley Region was identified by the California Geological Survey as having only an 11 to 20 year supply of aggregate left in 2012. Thus, there an existing cumulative impact in terms of regional availability of aggregate resources.

The project site was surfaced mined for aggregate between 1919 and 1995. Following the cessation of mining activities, mined areas of the site have been backfilled, which effectively precludes the resumption of aggregate mining operations. Furthermore, the Geotechnical Investigation prepared for the project site indicates that it has been mined of economic aggregate deposits and the remaining deposits that are of potential economic value are infeasible to mine, due to limited volume of the localized deposits, expense of removing the overburden (pond deposits), and difficulty associated with excavation logistics. Thus, resuming aggregate mining operations on the project site would not be economically feasible and the resource is effectively depleted. Accordingly, the conversion of the project site to residential and open space/recreational use would not cumulatively contribute to the loss mineral resources of value to the State or region because the site has been depleted of all economically recoverable aggregate materials.
4.2.12 - 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 analysis in Section 3.12, Noise includes a cumulative analysis of existing, proposed, and anticipated future noise levels near the project site. Outdoor noise measurements taken at the project site indicate that the average ambient noise levels are within the “normally acceptable” or “conditionally acceptable” range for all land uses. Therefore, there is no existing cumulatively significant noise impact in the project vicinity.

The proposed project’s construction noise levels may cause a temporary substantial increase in noise levels at nearby receptors. Mitigation is included that would require implementation of construction noise attenuation measures to reduce noise levels; however, construction noise levels may exceed adopted standards at certain nearby receptors and, therefore, is considered a significant unavoidable impact. Other projects listed in Table 4-1 would be required to implement similar mitigation and adhere to Municipal Code restrictions regarding construction noise. It is highly unlikely that a substantial number of the cumulative projects would be constructed simultaneously and close enough to one another for noise impacts to be compounded, given that the projects are at widely varying stages of approval and development. Therefore, it is reasonable to conclude that construction noise from the proposed project would not combine with noise from other development projects to cause cumulatively significant noise impacts.

The proposed project’s contribution to vehicular noise levels would not exceed annoyance thresholds, and impacts would be less than significant. Because vibration is a highly localized phenomenon, there would be no possibility for vibration associated with the project to combine with vibration from other projects because of their distances from the project site. Therefore, the proposed project would not contribute to a cumulatively significant vibration impact.

The proposed project’s contribution to vehicular noise levels would not exceed the applicable thresholds of significance, which take into account existing noise levels as well as noise from trips associated with other planned or approved projects. Thus, the proposed project would not combine with other projects to cause a cumulatively considerable increase in ambient roadway noise.

Other projects listed in Table 4-1 would be required to evaluate noise and vibration impacts and implement mitigation, if necessary, to minimize noise impacts pursuant to local regulations. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to noise.

4.2.13 - Population and Housing

The geographic scope of the cumulative population and housing analysis is the City of Orange. Population growth is typically measured in relation to the size of the applicable jurisdiction and, thus, the City of Orange is appropriate geographical area. No existing cumulatively significant impacts have been identified for this topic.

The proposed project would develop 129 dwelling units, which would add 396 persons to the City of Orange’s population, which represents an increase of 0.3 percent relative to the City’s population of...
141,420. The project site is currently designated for residential use by the City of Orange General Plan and Orange Zoning Ordinance and, thus, is contemplated to support population growth. Growth inducement impacts were found to be less than significant. Other development projects in the City of Orange would be reviewed for impacts on population growth and would be required to address any potential impacts with mitigation. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to growth inducement.

4.2.14 - Public Services

The geographic scope of the cumulative public services analysis is the service area of each of the providers serving the proposed project. Because of differences in the nature of the public service and utility topical 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, 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 Orange Fire Department’s service area, which consists of the Orange city limits.

The proposed project would develop 129 dwelling units on 40.2 acres of the project site and preserve the remaining acreage as open space. The proposed project is estimated to add 461 new residents to the City’s population. The project site is located within 1.75 miles of the nearest fire station and is within an acceptable response time for fire protection. As such, the proposed project would not create a need for new or expanded fire protection facilities and would not result in a physical impact on the environment.

The project site is adjacent to Santiago Oaks Regional Park and contains the wooded Santiago Creek Corridor. Thus, it is susceptible to wildland fires and would need to provide adequate emergency access. The proposed project would be required to prepare and implement a fuel modification plan and comply with all applicable Fire Code requirements for emergency access. Other projects listed in Table 4-1 that are susceptible to wildland fires would be required to implement similar mitigation. Because wildland fire exposure is dependent on location and development activities associated with the other projects listed in Table 4-1 may not occur in areas susceptible to such hazards, this effectively precludes the possibility of cumulative exposure.

Other development projects in the Fire Department’s 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. According to the Fire Department, existing facilities are sufficient to serve the proposed project in conjunction with existing and cumulative projects. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to fire protection and emergency medical services.

Police Protection

The geographic scope of the cumulative police protection analysis is the service area of the Orange Police Department, which consist of the Orange city limits.
The proposed project would develop 129 dwelling units on 40.2 acres of the project site and preserve the remaining acreage as open space. The proposed project is estimated to add 461 new residents to the City’s population. The Police Department indicated that it could serve the proposed project without needing new or expanded police protection facilities. Other development projects within the Police Department service area would be reviewed for impacts on police protection and would be required to address any potential impacts with mitigation. According to the Police Department, existing facilities are sufficient to serve the proposed project in conjunction with existing and cumulative projects. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to police protection.

**Schools**

The geographic scope of the cumulative school analysis is the Orange Unified School District (OUSD), which encompasses the City of Orange, and all or portions of Anaheim, Garden Grove, Santa Ana, and Villa Park.

The proposed project would develop 129 dwelling units on 40.2 acres of the project site and preserve the remaining acreage as open space. The proposed project is estimated to add 75 new students to OUSD. The proposed project would pay development fees to OUSD to fund capital improvements to school facilities. Other development projects within OUSD would be reviewed for impacts on schools and would be required to pay development fees. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to schools.

**Parks**

The geographic scope of the cumulative park analysis is the Orange city limits. Within the city limits are neighborhood parks, community parks, regional parks, trails, community gardens, and historic sites.

The proposed project would develop 129 dwelling units on 40.2 acres of the project site and preserve the remaining acreage as open space. The proposed project is estimated to add 461 new residents to the City’s population. The proposed project would provide a trail network and passive use areas (open space and greenway). The provision of these facilities would be expected to offset the increased demand for such facilities because project residents would be expected to use the facilities closest to where they live. Other development projects within the city limits would be reviewed for impacts on parks and would be required to dedicate new public facilities or pay development fees. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to parks.

**4.2.15 - Recreation**

The geographic scope of the cumulative recreation analysis is the Orange city limits. Within the city limits are neighborhood parks, community parks, regional parks, trails, community gardens, and historic sites.
The proposed project would develop 129 dwelling units on 40.2 acres of the project site and preserve the remaining acreage as open space. The proposed project is estimated to add 461 new residents to the City’s population. The proposed project would provide a trail network and passive use areas (open space and greenway). The provision of these facilities would be expected to offset the increased demand for such facilities because project residents would be expected to use the facilities closest to where they live. Other development projects within the city limits would be reviewed for impacts on parks and would be required to dedicate new public facilities or pay development fees. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to recreation.

4.2.16 - Transportation and Traffic

The geographic scope of the cumulative transportation analysis is the roadway network within the eastern portion of the City of Orange. As discussed in the Transportation Section 3.16 of this EIR, study facilities consist of ten study intersections and 17 roadway segments. Two study intersections and one study segment operate at unacceptable levels in one or more peak hours; therefore, a cumulatively significant transportation impact exists.

All of the new development projects listed in Table 4-1 would generate new vehicle trips that may trigger or contribute to unacceptable intersection operations and freeway operations. All projects would be required to mitigate for their fair share of impacts. The proposed project would result in 742 net new daily trips, including 50 net new trips during the weekday morning peak hour, and 118 net new trips during the weekday afternoon peak hour. Project-related trips would not cause any facilities operating at deficient levels to significantly deteriorate further under Modified Existing Traffic Conditions, Existing Plus Project Traffic Conditions, and Cumulative (2040) conditions. Project-related trips would cause one facility operating at deficient levels to significantly deteriorate further under Year 2022 conditions. Mitigation is proposed that would require the project applicant to contribute to planned improvements at this locations that would restore operations to acceptable levels. Therefore, the proposed project, in conjunction with other projects, would not result in a cumulatively significant impact to unacceptable traffic operations.

For other transportation-related areas (roadway safety; emergency access; public transit, bicycles and pedestrians), the proposed project would have potentially significant impacts related to roadway hazards, but after the implementation of mitigation, these impacts would be reduced to a level of less than significant. Other projects that result in similar impacts would be required to mitigate for their impacts. Because the proposed project can mitigate all other transportation impacts to a level of less than significant, it would not have a related cumulatively significant impact with respect to these other topics.

4.2.17 - Tribal Cultural Resources

Eligibility for California Register Listing

The geographic scope of the cumulative registered historical resources analysis is the project vicinity. Registered historical 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
construction; 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).

Construction activities associated with development projects in the project vicinity may have the potential to remove or damage registered historical resources. Given that neither the project site nor any other project site in the vicinity is listed on any national, state, or local registers of historic places (including those for tribal cultural resources), the proposed project would not make a cumulatively considerable contribution to any potentially significant cumulative impact or registered historical resources.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to registered historical resources.

**Eligibility as Determined by Lead Agency**

The geographic scope of the cumulative tribal cultural resources analysis is the project vicinity. Tribal 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).

Construction activities associated with development projects in the project vicinity may have the potential to encounter undiscovered tribal cultural resources. These projects would be required to mitigate for impacts through compliance with applicable federal and state laws governing tribal cultural resources. Even if a significant cumulative impact could be found, the proposed project would not make a cumulatively considerable impact with required compliance. The likelihood of any significant tribal cultural resources on the project site are very low given the developed nature of the site, previous disruptions to its ground, and the lack of any known resource within its boundaries. Although there is the possibility that previously undiscovered resources could be encountered by subsurface earthwork activities, the implementation of standard construction mitigation measures would ensure that undiscovered tribal cultural resources are not adversely affected by project-related construction activities, which would prevent the destruction or degradation of potentially significant tribal cultural resources in the project vicinity. Given the low potential for disruption, and compliance with construction best management practices that would apply to this project and those in the vicinity, the proposed project would not make a cumulatively considerable contribution to any potentially significant cumulative impact on tribal cultural resources.

Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to tribal cultural resources.

**4.2.18 - Utilities and Service Systems**

**Water**

The geographic scope of the cumulative potable water analysis is the City of Orange Water Division service area, which encompasses the Orange city limits and nearby unincorporated areas of Orange County. The City of Orange water service area has 36,347 customer accounts. Water supply impacts
are analyzed in Section 3.17, Utilities and Service Systems of this EIR, which concluded that the City of Orange has adequate potable water supplies to serve the proposed project, as well as other existing and future users. Therefore, there is no existing cumulatively significant impact related to potable water supply.

The proposed project is estimated to demand 116 acre-feet per year of potable water. The City of Orange 2015 Urban Water Management Plan indicates that potable water supplies were estimated to be 28,000 acre-feet in 2020 and are expected to increase to 29,500 acre-feet in 2040. The City of Orange has two supply sources (groundwater and imported water) and thus does not rely on a single water source. The proposed project’s increase in demand would represent less than 1 percent of potable water supplies under all scenarios between 2015 and 2035. Furthermore, the City of Orange 2015 Urban Water Management Plan assumed that 460 dwelling units and open space uses would be developed on the project site and, therefore, accounted for demand from the proposed project in its long-term demand projections.

It should be noted that not all of the projects listed in Table 4-1 are located within the City of Orange water service area. However, for those projects that are located with the City of Orange water service area, the 2015 Urban Water Management Plan anticipates adequate water supplies for all water year scenarios through 2040. These projects also would be required to demonstrate that they would be served with potable water service as a standard requirement of the development review process, and these projects may be required to implement water conservation measures to the extent they are required. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to water supply.

**Wastewater**

The geographic scope of the cumulative wastewater analysis is the areas tributary to Orange County Sanitation District (OCSD) Plant No. 1 and Plant No. 2. The two plants treat all of the effluent generated with the OCSD service area, which covers 479 square miles of central and northwest Orange County.

All future projects would be required to demonstrate that sewer service is available to ensure that adequate sanitation can be provided. The proposed project is estimated to generate 74,400 gallons of wastewater on a daily basis (0.074 million gallons per day [mgd]). Plant No. 1 and Plant No. 2 have a combined treatment capacity of 366 mgd of primary treatment capacity and 200 mgd of secondary treatment capacity. The increase of 0.074 mgd attributable to the proposed project represents less than 1 percent of available primary or secondary treatment capacity at the two plants and, thus, would not exceed the capacity of either plant. As such, the plants would be expected to accept the proposed project’s increase in effluent without needing to expand existing or construct new facilities, as the treatment capacity is sufficient to serve both the project and planned future development in the area. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to wastewater.
Storm Drainage

The geographic scope of the cumulative storm drainage analysis is Santiago Creek, which currently receives runoff from the project site and would continue to do so in the future.

All future development projects in the project vicinity would be required to provide drainage facilities that collect and detain runoff such that off-site releases are controlled and do not create flooding. The proposed project would install a network of storm drainage facilities within the project site consisting of inlets, underground piping, and basins. This system would serve 72.58 acres of the site and direct runoff to a 3-acre on-site stormwater detention basin in the western portion of the site. A flow control structure will be installed within the detention system to meter the outflow from the site to below predevelopment levels. Catch basins will be located at various points within the site to capture subarea flows. The system is designed to detain flows from a 100-year storm event as required by the Orange County Hydrology Manual. Two sub drainage areas will flow directly to Santiago Creek without detention. One of these areas is approximately 1.46 acres directly over the Handy Creek Channel. This flow will be directed to the Handy Creek Channel. The other area is the trail system adjacent to Santiago Creek and totals 6.20 acres. This flow will be picked up via a storm drain system, which will outlet at the same location as the detention basin outlet. The outlet structure from the detention basin to Santiago Creek will be protected by riprap and an energy dissipater. This would ensure that the proposed project would not contribute to downstream flooding conditions during peak storm events and would avoid cumulatively significant stormwater impacts to downstream waterways at times when capacity is most constrained. The proposed project would also implement pollution prevention measures during construction and operations to ensure that downstream water quality impacts are minimized to the greatest extent possible. Therefore, the proposed project, in conjunction with other planned and approved projects, would not have a cumulatively significant impact related to storm drainage.

Solid Waste

The geographic scope of the cumulative solid waste analysis is the areas served by the Frank Bowerman Sanitary Landfill, Olinda Alpha Sanitary Landfill, and the El Sobrante Landfill. The three landfills have a combined remaining capacity of 384.7 million cubic yards.

Future development projects would generate construction and operational solid waste and, depending on the volumes and end uses, would be required to implement recycling and waste reduction measures. The proposed project is anticipated to generate 1,380 cubic yards of solid waste during construction and a net increase of 167 cubic yards annually during operations. Both waste generation values represent less than 1 percent of the remaining capacity figure at the three landfills. As such, sufficient capacity is available to serve the proposed project as well as existing and planned land uses in the City of Orange for the foreseeable future. Accordingly, the proposed 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 Southern California Edison (SCE) service area (electricity) and the Southern California Gas Company service area (natural gas). SCE’s
electrical service area consists of approximately 50,000 square miles and 5 million metered customers. The Gas Company’s natural gas service area encompasses the southern San Joaquin Valley, the Los Angeles Basin, the Inland Empire, and the Coachella Valley, and has approximately 5.9 million metered customers.

The proposed project would demand an estimated 944,100 million kilowatt-hours (kWh) of electricity and 5.25 million cubic-feet of natural gas on an annual basis. The proposed project’s structures would be designed in accordance with Title 24, California’s Energy Efficiency Standards for Residential and Nonresidential Buildings. These standards include minimum energy efficiency requirements related to building envelope, mechanical systems (e.g., HVAC and water heating systems), indoor and outdoor lighting, and illuminated signs. 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. Therefore, the proposed project, in conjunction with other future projects, would not have a cumulatively significant impact related to energy consumption.
SECTION 5: ALTERNATIVES TO THE PROPOSED PROJECT

5.1 - Introduction

In accordance with CEQA Guidelines Section 15126.6, this Environmental Impact Report (EIR) 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 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. Important considerations for these alternatives analyses are noted below (as stated in 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

No significant unavoidable impacts have been identified in this Draft EIR. All impacts were found to be less than significant after mitigation or less than significant with no mitigation required.

5.1.2 - Alternatives to the Proposed Project

The four alternatives to the proposed project analyzed in this section are as follows:

- **Development within the Existing Land Use Designations Alternative:**
  This alternative consists of new residential development and the continuation of existing sand and gravel operations in accordance with the existing City of Orange General Plan designations. Residential uses would be developed on 15.4 acres north of Santiago Creek (77 dwelling units), with sand and gravel activities occurring on 77.3 acres on both sides of the waterway. The existing R-1-8 Zoning for the residential area would provide a maximum of 77 single-family dwelling units based on acre density and would yield approximately 40 to 50 single-family dwelling units (although a range of 32 to 92 dwelling units could be developed under the existing land use designations). The Santiago Creek corridor would be designated for open space (16.5 acres). The Development within the Existing Land Use Designations Alternative is depicted in Exhibit 5-1.

- **No Project Alternative/Existing Land Use Activities Alternative:**
  This alternative consists of the continuation of the sand and gravel operations on approximately 77.3 acres of the project site. No dwelling units would be constructed on-site. The project site would remain inaccessible to the public under this alternative.
• Land Use Plan/OPA 2008 “WIN-WIN” Alternative:
  In 2008, The Orange Park Association Real Estate Committee and Board of Directors considered a development proposal(s), prepared/presented by the developer for several parcels of property controlled by JMI Properties. The Orange Park Association Real Estate Committee and Board of Directors additionally considered alternative options for these parcels that did not originate with JMI Properties.

Immediately below is Alternative One of two alternatives prepared by the Orange Park Association Real Estate Committee and Board of Directors. Each alternative addresses a development option for properties proposed by the Orange Park Acres Association. The alternatives are mutually exclusive (i.e., either one or the other may be selected).

As part of the current effort, Alternative 1 has been evaluated and compared to the project as set forth in the Preface of this document.

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of 39 one-acre minimum equestrian lots for the Ridgeline property and 22 one-acre lots for Rio Santiago; totaling 61 dwellings, a 43-acre Greenway Reserve 30-acre Active Recreational Parcel, and 15-acre Commercial Equestrian Parcel located adjacent to The Reserve residential community. Overall, the OPA 2008 “WIN-WIN” Alternative would have 68 fewer dwellings, but would have 46-acres less open space in comparison to the project as set forth in the Preface of this document, and it excludes all items listed in the preface to the Draft EIR. The Land Use Plan/OPA 2008 “WIN-WIN” Alternative, as depicted in Exhibit 5-2, was included in the Position Statement for the Rio Santiago project (see Appendix L).

Three alternatives to the proposed project are analyzed in the following section. 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.
Development Within The Existing Land Use Designations Alternative
Orange Park Acres "Win-Win" Plan for the Sully Miller site

Concept by OPA and Real Estate Committee - July 2008
Exhibit 5-2
5.2 - Project Objectives

As stated in Section 2, Project Description, the objectives of the proposed project are to:

OBJ-1. Locate single-family detached residential units in the most suitable areas of the project site and preserve other areas for open space and greenway.

OBJ-2. Preserve and protect Santiago Creek by abating the remnants of the resource extraction activities and establishing a greenway along the creek corridor.

OBJ-3. Promote land use compatibility with neighboring residential uses through the use of locating landscaped setbacks, and the development of a compatible housing product and lot size to the adjoining uses.

OBJ-4. Develop a network of publicly accessible trails within the project site that provide access to Santiago Creek and Santiago Oaks Regional Park.

OBJ-5. Lessen the noise, improve air quality, and reduce traffic impacts from the existing materials recycling and backfilling operations within the project site.

OBJ-6. Provide a circulation system that will minimize adverse effects on local residential neighborhoods and encourage pedestrian and bicycle circulation.

OBJ-7. Provide an infrastructure system, including sewer, water, and storm drain systems that will adequately serve full build-out of the proposed project.

OBJ-8. Improve local circulation by widening of Santiago Canyon Road and restriping Cannon Road prior to the first certificate of occupancy.

5.3 - Alternative 1—Development within the Existing Land Use Designations

CEQA Guidelines Section 15126.6(e) requires that an EIR evaluate a “No Project Alternative,” which is intended to allow decision-makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project. In cases where the project constitutes a land development project, the No Project Alternative is the “circumstance under which the project does not proceed.” For many projects, the No Project Alternative represents a “No Development” or an “Existing Conditions” scenario, in which the project site remains in its existing condition and no new development occurs for the foreseeable future. However, CEQA Guidelines Section 15126.6(e)(3)(B) establishes that “if disapproval of the project under consideration would result in predictable actions by others such as the proposal of some other project, this ‘no project’ consequence should be discussed.”

In this case, the No Project Alternative consists of development and land use activities that would occur pursuant to the existing City of Orange General Plan land use designations of low-density residential, resource, and open space for the project site.

Residential uses would be developed 15.4 acres north of Santiago Creek, with resource land use activities (sand, gravel, and materials recycling) occurring on 77.3 acres on both sides of the
waterway. Consistent with the General Plan’s density range of 2.1 to 6.0 units per acre, there is an allowable range of 32 to 92 residential homes, and a target of 77 residential homes on this 15.4-acre residential land use parcel. The existing R-1-8 Zoning for the residential area would provide a maximum of 77 single-family dwelling units based on acre density and would yield approximately 40 to 50 single-family dwelling units (although a range of 32 to 92 dwelling units could be developed under the existing land use designations). Vehicular access would be taken from two points on Mabury Drive.

The intersection of Santiago Canyon Road/Nicky Way would be improved to provide turn lanes and improved access to the materials recycling and backfilling operation.

The total number of dwelling units that would be developed under this alternative would be 90.

Resource land use activities would be located on 77.3 acres on both sides of the waterway. These activities would consist of the continuation of the existing materials recycling and backfilling operation.

The Santiago Creek corridor would be designated for open space (16.5 acres). However, no community or recreational uses would be developed.

This alternative would require a General Plan Amendment to remove the project site from the East Orange General Plan and Orange Park Acres Plan.

Table 5-1 summarizes the Development within the Existing Land Use Designations Alternative. The Development within the Existing Land Use Designations Alternative is depicted in Exhibit 5-1.

### Table 5-1: Development within the Existing Land Use Designations Alternative Summary

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Land Use</th>
<th>Acres</th>
<th>Dwelling Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Development within the Existing Land Use Designations Alternative</td>
<td>Residential (North Bank)</td>
<td>15.4</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>Materials Recycling and Backfilling/Sand and Gravel</td>
<td>77.3</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Santiago Creek Greenway Open Space</td>
<td>16.5</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>109</strong></td>
<td><strong>77</strong></td>
</tr>
<tr>
<td>Proposed Project</td>
<td>Residential</td>
<td>40.2</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Santiago Creek Greenway Open Space/Passive Green Area</td>
<td>69</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td><strong>109.2</strong></td>
<td><strong>129</strong></td>
</tr>
</tbody>
</table>

Source: FCS, 2016.

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1 The No Project Alternative/Existing Land Use Designations Alternative corresponds to Alternative F in the Pre-Development Agreement (PDA). Refer to Section 2, Project Description for further discussion of the PDA.
5.3.1 - Impact Analysis

Aesthetics, Light, and Glare

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. The addition of residential units on 15.4 acres on the north bank of Santiago Creek alongside the existing 77.3 acres of resource extraction on the south bank represents a net increase in development and disturbance relative to the proposed project, which would result in greater visual change and more sources of light and glare. In contrast, the proposed project would avoid any significant changes to the north bank of Santiago Creek and 69 acres of open space overall and, thus, would not alter the existing visual or light and glare conditions of these areas. Therefore, the Development within the Existing Land Use Designations Alternative would have greater aesthetics, light, and glare impacts than the proposed project.

Agriculture Resources and Forest Resources

There are no agriculture or forest resources on the project site. Therefore, the Development within the Existing Land Use Designations Alternative would have impacts on agriculture resources and forest resources similar to the proposed project.

Air Quality

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net decrease in development activity relative to the proposed project and, thus, fewer construction emissions of criteria pollutants would occur. Additionally, this alternative would generate 12 fewer daily trips, which would result in fewer operational emissions of criteria pollutants. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer air quality impacts than the proposed project.

Biological Resources

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in disturbance relative to the proposed project, including to the most biologically sensitive areas on the north bank of Santiago Creek. In contrast, the proposed project would avoid any disturbance to the north bank of Santiago Creek and, thus, would not disturb any biological resources within this area. Therefore, the Development within the Existing Land Use Designations Alternative would have greater biological resources impacts than the proposed project.

Cultural Resources

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in development and disturbance relative to the proposed project, particularly within the undisturbed
areas on the north side of Santiago Creek. As noted in Section 3.5, Cultural Resources, the north side of Santiago Creek that has exposures of undifferentiated deposits of the Oligo-Miocene Sespe/Vaqueros Formations; these exposures have marine and non-marine components. In contrast, the proposed project would avoid any disturbance to the north bank of Santiago Creek and, thus, would not disturb any cultural resources within this area. Therefore, the Development within the Existing Land Use Designations Alternative would have greater cultural resources impacts than the proposed project.

Geology and Soils
The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in development and disturbance relative to the proposed project and, thus, greater potential for exposure to seismic hazards and the potential for erosion. In contrast, the proposed project would only develop and disturb 40.2-acres within the current resource extraction area and conserve the north side of Santiago Creek as open space. Therefore, the Development within the Existing Land Use Designations Alternative would have greater geology and soils impacts than the proposed project.

Greenhouse Gas Emissions
The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net decrease in development activity relative to the proposed project and, thus, fewer construction emissions of greenhouse gas emissions would occur. Additionally, this alternative would generate 12 fewer daily trips, which would result in fewer operational emissions of greenhouse gas emissions. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer greenhouse gas emissions impacts than the proposed project.

Hazards and Hazardous Materials
The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Because the resource extraction operation would continue, no mitigation for soil vapors (trichloroethylene and methane) or petroleum-impacted soil would be implemented since these conditions do not pose a safety risk to this land use activity. Furthermore, both the north side of Santiago Creek and the Mara Brandman Arena do not contain any existing land use activities that involve the regular use of large quantities of hazardous materials and are not listed on hazardous materials databases; thus, they are suitable to support new residential development. Therefore, the Development within the Existing Land Use Designations Alternative would have hazards and hazardous materials impacts similar to the proposed project.
Hydrology and Water Quality

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction and backfilling activities on 77.3 acres of the project site. The existing resource extraction and backfilling activities would continue to discharge into the Handy Creek storm drain. The residential development would increase hydrology and water quality impacts north of Santiago Creek, as the proposed project proposes Greenway Open Space north of Santiago Creek and moves residential development to the south side of Santiago Creek. However, while the increase in residential development would create greater impacts north of Santiago Creek, the extraction and backfilling activities have a current grading permit, any change, update, or renewal of the permit would need to be reviewed and approved as part of the permit process to ensure water quality compliance. Therefore, Development within the Existing Land Use Activities Alternative would have hydrology and water quality impacts similar to the proposed project.

Land Use and Planning

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. This alternative would maintain the existing General Plan and zoning for the project site, whereas the proposed project would amend the existing land use designations. Although the proposed amendments were found to be compatible with the General Plan, Municipal Code, and surrounding land uses, this alternative would avoid the need to do so. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer land use and planning impacts than the proposed project.

Mineral Resources

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. This alternative would retain 71 percent of the site for resource extraction activities. Thus, this alternative would lessen the severity of impacts associated with the loss of mineral resources of statewide or local importance. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer mineral resource impacts than the proposed project.

Noise

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Under this Alternative, the north bank of Santiago Creek would see an increase in noise levels from construction compared with the proposed project, which does not place development in this area. However, overall, this represents a net decrease in development activity relative to the proposed project and, thus, less construction noise would occur. Additionally, this alternative would generate 12 fewer daily trips, which would result in slightly less roadway noise. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer noise impacts than the proposed project.
Population and Housing

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units within the project site, a net decrease of 67 dwelling units relative to the proposed project. The reduction in dwelling units would decrease the population growth attributable to this alternative by 198 persons relative to the proposed project. Additionally, both the portion of the project site that would support residential uses under this alternative and the Mara Brandman Arena are designated for residential uses, and, therefore, this population increase would be considered “planned growth.” Therefore, the Development within the Existing Land Use Designations Alternative would have fewer population and housing impacts than the proposed project.

Public Services

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units within the project site, a net decrease of 67 dwelling units relative to the proposed project. The reduction in dwelling units would reduce the population growth attributable to this alternative by 198 persons relative to the proposed project. This would result in a decrease in demand for fire, police, schools, parks, and other public facilities. Furthermore, the existing resource extraction operation, which has negligible demand for public services, would continue as a land use activity. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer public services impacts than the proposed project.

Recreation

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units within the project site, a net decrease of 67 dwelling units relative to the proposed project. The reduction in dwelling units would reduce the population growth attributable to this alternative by 198 persons relative to the proposed project. This would result in a decrease in demand for recreation. Furthermore, the proposed project’s recreational uses would not be developed under this alternative. While this would result in fewer new recreational opportunities, it would also avoid creating any impacts associated with the development of these facilities. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer recreation impacts than the proposed project.

Transportation

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Table 5-2 summarizes the trip generation associated with this alternative. As shown in the table, this alternative would result in a net decrease of 50 daily trips, a net increase of 9 AM peak-hour trips, and a net decrease of 41 PM peak-hour trips. The proposed project was found to contribute to deficient operations at one intersection (Santiago Canyon Road/Orange Park Boulevard) during the PM peak hour and would implement mitigation in form of fair-share payments to fund improvements to restore operations to acceptable levels. Thus, this alternative would implement similar mitigation and yield a similar conclusion; however, because it generates fewer trips during the impacted peak hour, it would lessen the severity of impacts.
Table 5-2: Development within the Existing Land Use Designations Alternative Trip Generation Comparison

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Net Change in Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Development within the Existing Land Use</td>
<td>730</td>
</tr>
<tr>
<td>Designations Alternative</td>
<td></td>
</tr>
<tr>
<td>Proposed Project</td>
<td>742</td>
</tr>
<tr>
<td>Difference</td>
<td>(12)</td>
</tr>
</tbody>
</table>

Note: The Development within the Existing Land Use Designations Alternative excludes existing materials and recycling trip generation as this is an existing use that would be maintained. Additionally, the 16.5-acre open space area along Santiago Creek would not generate any trips because it would not be publicly accessible.

This alternative would also require improvements to the Santiago Canyon Road/Nicky Way intersection, which would provide access to the resource extraction operations on the project site. Additionally, improvements would be required to Mabury Drive to allow for access to the residential uses developed on the north side of Santiago Creek.

Overall, this alternative would generate more daily and AM peak-hour trips, but fewer peak-hour trips during the PM peak hour than existing conditions, which is when the significant impacts occur. Thus, the reduction in PM peak-hour trips offsets the increase in daily and AM peak-hour trips. Therefore, the Development within the Existing Land Use Designations Alternative would have fewer transportation impacts than the proposed project.

**Tribal Cultural Resources**

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units on 15.4 acres on the north side of Santiago Creek, and maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in development and disturbance relative to the proposed project, particularly within the undisturbed areas on the north side of Santiago Creek. In contrast, the proposed project would avoid any disturbance to the north bank of Santiago Creek and, thus, would not disturb any potential tribal cultural resources within this area. Therefore, the Development within the Existing Land Use Designations Alternative would have greater tribal cultural resources impacts than the proposed project.

**Utilities and Service Systems**

The Development within the Existing Land Use Designations Alternative consists of developing 77 dwelling units within the project site, a net decrease of 73 dwelling units relative to the proposed project. The reduction in dwelling units would decrease the population growth attributable to this alternative by 198 persons relative to the proposed project. This would result in less demand than the proposed project for water, wastewater, solid waste, electricity, and natural gas.
For storm drainage, the net increase in development and disturbance relative to the proposed project would have a greater potential for additional runoff to be added to downstream waterways. In particular, the existing resource extraction activities would continue to discharge into the Handy Creek storm drain, which lacks sufficient capacity for a 100-year storm event. In contrast, the proposed project would result in a net decrease in discharge to the Handy Creek storm drain, which would serve to lessen the severity of this existing deficient condition.

Therefore, the Development within the Existing Land Use Designations Alternative would have fewer utilities and service system impacts than the proposed project.

5.3.2 - Conclusion

The Development within the Existing Land Use Designations Alternative would increase the severity of the proposed project’s aesthetics, light, and glare; biological resources; cultural resources; geology and soils; tribal cultural resources; and hydrology and water quality. However, it would lessen the severity of the proposed project’s air quality, greenhouse gas, land use, mineral resources, noise, population and housing, public services, recreation, transportation, and utilities and service systems impacts. This alternative would yield similar impacts for all other topics.

The Development within the Existing Land Use Designations Alternative would advance some, but not all of the project objectives. This alternative would advance the objectives that concern clustering residential development in the most suitable areas of the project site; and promoting land use compatibility with surrounding land uses. However, none of these objectives would be advanced to the same degree as the proposed project because (1) fewer dwelling units would be developed; (2) the resource extraction land use activities would be retained; (3) less open space would be provided; and (4) no public recreational facilities would be provided.

Furthermore, this alternative would not advance the objectives that concern facilitating the redevelopment of an unsightly, underused resource extraction site; guiding the transition of an infill site with a Specific Plan; protecting Santiago Creek by abating the remnants of the resource extraction activities; strategically locating the adjoining Villa Park Landfill and the proposed residential uses; and developing a logical internal circulation system for pedestrians, bicyclists, equestrians, and motorists.

5.4 - Alternative 2—No Project Alternative/Existing Land Use Activities Alternative

The No Project Alternative/Existing Land Use Activities Alternative consists of the continuation of the existing sand and gravel operations on approximately 77.3 acres of the project site. Approximately 40 acres between Santiago Creek and E. Santiago Canyon Road are characterized by soil piles and berms, unpaved roads. An approximately 5-acre area near E. Santiago Canyon Road supports a materials recycling operation that includes apparatus for crushing boulders, bricks, rocks, and similar materials for recycling. Since 2015, backfilling operations have been limited to 15 consecutive business days in any 6-month period; this alternative would allow backfilling operations
to resume year-round as allowed by the current grading permit. The project site would remain inaccessible to the public under this alternative.

5.4.1 - Impact Analysis

Aesthetics, Light, and Glare

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in disturbance relative to the proposed project, because the 77.3-acre backfilling operations would resume year-round as allowed by the grading permit and the proposed project would disturb only 40.2-acres, which would result in greater visual change and more sources of light and glare. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have greater aesthetics, light, and glare impacts than the proposed project.

Agriculture Resources and Forest Resources

There are no agriculture or forest resources on the project site. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have no impacts on agriculture resources and forest resources similar to the proposed project.

Air Quality

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Compared with the continuation of backfilling operations as allowed by the current grading permit that would take place under the continued resource extraction activities, this alternative would generate 742 fewer daily trips, which would result in fewer operational emissions of criteria pollutants. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer air quality impacts than the proposed project.

Biological Resources

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on the full 77.3 acres of the project site. Overall, this represents a net increase in disturbance relative to the proposed project, as the proposed project would create 69-acres of open space and only disturb 40.2-acres. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have greater biological resources impacts than the proposed project.

Cultural Resources

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Since current resource extraction activities have already disturbed the 77.3 acres, the No Project Alternative/Existing Land Use Activities Alternative would have fewer cultural resources impacts than the proposed project.
Geology and Soils
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Since the No Project Alternative/Existing Land Use Activities Alternative does not include residential development, there would be fewer impacts related to seismic hazards. However, overall, this represents a net increase in disturbance relative to the proposed project and, thus, greater potential for exposure to seismic hazards and the potential for erosion. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have greater geology and soils impacts than the proposed project.

Greenhouse Gas Emissions
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. This alternative would generate 742 fewer daily trips, which would result in fewer operational emissions of greenhouse gas emissions. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer greenhouse gas emissions impacts than the proposed project.

Hazards and Hazardous Material
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Because the resource extraction operation would continue, no mitigation for soil vapors (trichloroethylene and methane) or petroleum-impacted soil would be implemented since these conditions do not pose a safety risk to this land use activity. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would result in hazards and hazardous materials impacts similar to the proposed project.

Hydrology and Water Quality
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. The existing resource extraction and backfilling activities would continue to discharge into the Handy Creek storm drain. The extraction and backfilling activities have a current grading permit, any change, update, or renewal of the permit would need to be reviewed and approved as part of the permit process to ensure water quality compliance. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer hydrology and water quality impacts than the proposed project.

Land Use and Planning
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. This alternative would maintain the existing General Plan and zoning for the project site, whereas the proposed project would amend the existing land use designations. Although the proposed amendments were found to be compatible with the General Plan, Municipal Code, and surrounding land uses, this alternative would avoid the need to do so. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer land use and planning impacts than the proposed project.
Mineral Resources
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. This alternative would retain 71 percent of the site for resource extraction activities; hence, extraction and backfilling operations would resume year-round as allowed by the grading permit. Thus, this alternative would lessen the severity of impacts associated with the loss of mineral resources of statewide or local importance. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer mineral resource impacts than the proposed project.

Noise
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Overall, this represents a net increase in disturbance relative to the proposed project. This alternative would generate 742 fewer daily trips than the proposed project, which would result in slightly less roadway noise. However, this alternative would result in a greater number of operational heavy-duty vehicles on-site, since extraction and backfilling operations would resume year-round as allowed by the grading permit. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have greater impacts than the proposed project.

Population and Housing
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. No dwelling units would be built on the project site under this alternative. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer population and housing impacts than the proposed project.

Public Services
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. No dwelling units would be built on the project site under this alternative. This would result in a decrease in demand for fire, police, schools, parks, and other public facilities. Furthermore, the existing resource extraction operation, which has negligible demand for public services, would continue as a land use activity. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer public services impacts than the proposed project.

Recreation
The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. No dwelling units would be built on the project site under this alternative. This would result in a decrease in demand for recreation. Furthermore, the proposed project’s recreational uses would not be developed under this alternative. While this would result in fewer new recreational opportunities, it would also avoid creating any impacts associated with the development of these facilities. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer recreation impacts than the proposed project.
Transportation and Traffic

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. Table 5-3 summarizes the trip generation associated with this alternative. As shown in the table, this alternative would result in a net reduction of 742 daily trips, 50 AM peak-hour trips, and a net decrease of 118 PM peak-hour trips.

The proposed project was found to contribute to deficient operations at one intersection (Santiago Canyon Road/Orange Park Boulevard) during the PM peak hour and would implement mitigation in form of fair-share payments to fund improvements to restore operations to acceptable levels. Because this alternative generates fewer trips, it would result in less severe impacts. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have fewer transportation impacts than the proposed project.

Table 5-3: No Project Alternative/Existing Land Use Activities Alternative Trip Generation Comparison

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Daily</th>
<th>AM Peak</th>
<th>PM Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Project Alternative/Existing Land Use Activities Alternative</td>
<td>686</td>
<td>63</td>
<td>32</td>
</tr>
<tr>
<td>Proposed Project</td>
<td>1,428</td>
<td>113</td>
<td>150</td>
</tr>
<tr>
<td>Difference</td>
<td>(742)</td>
<td>(50)</td>
<td>(118)</td>
</tr>
</tbody>
</table>

Source: Elfend & Associates, 2017

Tribal Cultural Resources

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. As the current resource extraction activities have already disturbed the 77.3 acres, the No Project Alternative/Existing Land Use Activities Alternative would have tribal cultural resources impacts similar to the proposed project.

Utilities and Service Systems

The No Project Alternative/Existing Land Use Activities Alternative consists of maintaining the existing resource extraction activities on 77.3 acres of the project site. No dwelling units would be built on the project site under this alternative. This would result in less demand for water, wastewater, solid waste, electricity, and natural gas. In particular, the existing resource extraction activities would continue to discharge into the Handy Creek storm drain, which lacks sufficient capacity for a 100-year storm event. In contrast, the proposed project would result in a net decrease in discharge to the Handy Creek storm drain, which would serve to lessen the severity of this existing deficient condition. Therefore, the No Project Alternative/Existing Land Use Activities Alternative would have greater utilities and service system impacts than the proposed project.
5.4.2 - Conclusion

The No Project Alternative/Existing Land Use Activities Alternative would increase the severity of the proposed project’s aesthetics, light, and glare; biological resources; cultural resources; geology and soils; noise and utilities and service systems impacts. However, it would lessen the severity of the proposed project’s air quality, greenhouse gases, hydrology and water quality, mineral resources, population and housing, public services, recreation, and transportation and traffic impacts. This alternative would yield similar impacts for agricultural resources and hazards and hazardous materials.

The No Project Alternative/Existing Land Use Activities Alternative would advance some, but not all, of the project objectives. This alternative would advance the objectives that concern positively contributing to the local economy through ongoing mineral extraction. However, none of the objectives would be advanced to the same degree as the proposed project because (1) no dwelling units would be developed; (2) the resource extraction land use activities would be retained; (3) less open space would be provided; and (4) no public recreational facilities would be provided.

Furthermore, this alternative would not advance the objectives that concern facilitating the redevelopment of an unsightly, underused resource extraction site; guiding the transition of an infill site with a Specific Plan; protecting Santiago Creek by abating the remnants of the resource extraction activities; strategically locating the adjoining Villa Park Landfill and the proposed residential uses; and developing a logical internal circulation system for pedestrians, bicyclists, equestrians, and motorists.

5.5 - Alternative 3—Land Use Plan/OPA 2008 “WIN-WIN” Alternative

Alternative 1 of the ORANGE PARK ACRES POSITION STATEMENT (“Position Statement”) has been evaluated in comparison to the proposal set forth in the Preface of this document.

In 2008, The Orange Park Association Real Estate Committee and Board of Directors considered a development proposal(s), prepared/presented by the developer for several parcels of property controlled by JMI Properties. The Orange Park Association Real Estate Committee and Board of Directors additionally considered alternative options for these parcels that did not originate with JMI Properties.

Immediately below is Alternative One of two alternatives prepared by the Orange Park Association Real Estate Committee and Board of Directors. Each alternative addresses a development option for properties proposed by the Orange Park Acres Association. The alternatives are mutually exclusive (i.e., either one or the other may be selected).

As part of the current effort, Alternative 1 has been evaluated and compared to the project as set forth in the Preface of this document.

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of 39 one-acre minimum equestrian lots for the Ridgeline property and 22 one-acre lots for Rio Santiago; totaling 61 dwellings, a 43-acre Greenway Reserve 30-acre Active Recreational Parcel, and 15-acre Commercial Equestrian Parcel located adjacent to The Reserve residential community. Overall, the OPA 2008 “WIN-WIN”
Alternative would have 68 fewer dwellings, but would have 46-acres less open space in comparison to the project as set forth in the Preface of this document, and it excludes all items listed in the Preface to the Draft EIR. The Land Use Plan/OPA 2008 “WIN-WIN” Alternative, as depicted in Exhibit 5-2, was included in the Position Statement for the Rio Santiago project (see Appendix L).

A description of the Land Use Plan/OPA 2008 “WIN-WIN” Alternative and a comparison with the proposed project is provided below.

5.5.1 - Land Use Plan/OPA 2008 “WIN-WIN” Alternative Description

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consisted of the following on the Sully Miller site, as depicted in Exhibit 5-2:

- Area A: 22 one-acre Equestrian Lots on 25 acres
- Area B: Santiago Creek Greenway Reserve, 43 acres
- Area C: Recreational Parcel, 30 acres
- Area D: Commercial Equestrian Parcel, 15 acres
- Area H: Equestrian Area Site: 7.6 acres
  - Note: This is a previously existing use that would only receive improvements under the Land Use Plan/OPA 2008 “WIN-WIN” Alternative and is therefore not included toward the total acreage of the alternative.

Additionally, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative planned for 39 one-acre minimum equestrian residential lots on the 52-acre Ridgeline property.

5.5.2 - Land Use Plan/OPA 2008 “WIN-WIN” Alternative and Proposed Project Comparison

- As stated above, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative consisted of 39 one-acre lots on the Ridgeline property and 22 one-acre lots on Sully Miller totaling 61 homes. In contrast, the proposed project includes 129 homes for a difference of 68 homes. The Land Use Plan/OPA 2008 “WIN-WIN” Alternative has 77 acres of area developed for residential uses, while the proposed project has approximately 40.2 acres of area developed for residential uses.
- The Land Use Plan/OPA 2008 “WIN-WIN” Alternative has an approximate 43-acre Santiago Creek Greenway as open space. The proposed project has an approximate 69-acre greenway/open space component. Additionally, as described below, the proposed project would provide an additional 52 acres of publicly accessible open space on the Ridgeline property, totaling 121 acres.

Overall, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative land uses on the Sully Miller site would be similar in nature to those of the proposed project; however, this alternative creates more impacts to open space and passive recreation opportunities both on the Sully Miller site and from the residential development of the Ridgeline property. This alternative also excludes all items listed in
the preface to the Draft EIR, which are a part of the proposed project. These items include the following improvements and related considerations:

1. The Property Owner proposes to widen Santiago Canyon Road and restripe Cannon Road prior to the occupancy of any housing units. The Cannon Road restriping shall be initiated within 60 days after the Tentative Map approval and all appeal periods have expired.

2. The Property Owner proposes to fund approximately $4,100,000.00 in landscape and other improvements for the Santiago Creek Greenway. Said improvements are to be completed or funded prior to the sixtieth certificate of occupancy.

3. The Property Owner is proposing to fund $1,000,000.00 in local trail improvements to be coordinated with the OPA and the City of Orange prior to the first certificate of occupancy.

4. The Property Owner will finance and fund the acquisition of the RIDGELINE PROPERTY, consisting of approximately 52 acres to the City of Orange or nonprofit entity for permanent publicly available open space, thus ending years of community uncertainty and division prior to the first certificate of occupancy.

5. The Property Owner will provide $2,000,000.00 prior to the first certificate of occupancy in funding for the relocation of the Mara Brandman Arena to the Ridgeline property and any other public improvements to serve the community.

As stated above, the purpose of this alternative is to evaluate a previously considered land use concept derived from the Position Statement. Table 5-4 summarizes the Land Use Plan/OPA 2008 “WIN-WIN” Alternative.

Table 5-4: Land Use Plan/OPA 2008 “WIN-WIN” Alternative Summary

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Land Use</th>
<th>Acres</th>
<th>Dwelling Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use Plan/OPA 2008 “WIN-WIN” Alternative</td>
<td>Residential (Including the Ridgeline Property)</td>
<td>77</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>Santiago Creek Greenway Open Space greenway, organic gardens and community activity center</td>
<td>88</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td>165</td>
<td>61</td>
</tr>
<tr>
<td>Proposed Project</td>
<td>Residential</td>
<td>40.2</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>Santiago Creek Greenway Open Space/ Passive Green Area</td>
<td>69</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td><strong>Subtotal</strong></td>
<td>109.2</td>
<td>129</td>
</tr>
</tbody>
</table>

Source: FCS, 2017
5.5.3 - Impact Analysis

Aesthetics, Light, and Glare

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed project overall. Residential uses would be located in the same general location on-site, but concentrated to the southeastern portion of the site, and would be used for land use activities similar to the proposed project; furthermore, the 50-acre Ridgeline Property would also be developed with residential units. Similar exterior light fixtures would be installed on the residential portions of the site; however, the Commercial Equestrian Parcel would increase light impacts more than the Open Space Grass Lands of the proposed project, The Reserve community would also be impacted. The Recreation Parcel would impact aesthetics, light, and glare in the surrounding neighborhoods of Mabury Ranch, West of Cannon, and Jamestown more than the residential units in the proposed project, as active recreation uses include soccer fields, softball fields, tennis courts, and a driving range. Additionally, the development of the Commercial Equestrian Parcel would increase the aesthetics, light, and glare impacts to The Reserve community compared with the Open Space Grasslands in the proposed project. Furthermore, the development of housing on the currently vacant Ridgeline Property would increase aesthetics, light, and glare impacts to Orange Park Acres community compared with the proposed project, which does not include development of this parcel. As with the proposed project, no disturbance to the north bank of the creek would occur. Overall, the increase in active recreation uses would increase the severity of aesthetics, light, and glare impacts. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater aesthetics, light, and glare impacts than the proposed project.

Agriculture Resources and Forest Resources

There are no agriculture or forest resources on the project site. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have impacts on agriculture resources and forest resources similar to the proposed project.

Air Quality

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. Overall, this represents a net increase in development activity relative to the proposed project; thus, more construction emissions of criteria pollutants would occur. This alternative would also generate fewer daily trips, which would result in fewer operational emissions of criteria pollutants. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have fewer air quality impacts than the proposed project.

Biological Resources

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed
project. Residential uses would be located in the same location as the proposed project and, therefore, would require similar mitigation measures for biological resources. The reduction in residential uses would be reallocated to open space uses on the south side of Santiago Creek; as with the proposed project, no disturbance to the north bank of the creek would occur. The south side of Santiago Creek contains the most biologically sensitive portions of the project site, which is where the Land Use Plan/OPA 2008 “WIN-WIN” Alternative proposes development on Area D to Commercial Equestrian Parcel, whereas the proposed project has the same area as Open Space Grasslands. Additionally, the development footprint of Area C has a larger footprint than the residential footprint in the proposed project. Furthermore, the development of housing on the currently vacant Ridgeline Property would increase biological resources impacts compared with the proposed project, which does not include development of this parcel. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater biological resources impacts than the proposed project.

Cultural Resources

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed project. Residential uses would be located in the same location as the proposed project and, therefore, would require similar mitigation measures for cultural resources. The reduction in residential uses would be reallocated to open space uses on the south side of Santiago Creek; as with the proposed project, no disturbance to the north bank of the creek would occur. However, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative proposes development on Area D to Commercial Equestrian Parcel, whereas the proposed project has the same area as Open Space Grasslands. Additionally, the development footprint of Area C has a larger footprint than the residential footprint in the proposed project. Furthermore, the development of housing on the currently vacant Ridgeline Property would increase cultural resources impacts compared with the proposed project, which does not include development of this parcel. As with the proposed project, no disturbance to the north bank of the creek would occur. The increase in disturbance would increase the severity of cultural resources impacts. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater cultural resources impacts than the proposed project.

Geology and Soils

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed project. Residential uses would be located in the same location as the proposed project and, therefore, would require similar mitigation measures for seismic hazards and erosion. As with the proposed project, no disturbance to the north bank of the creek would occur. The reduction in residential uses would be reallocated to open space uses on the south side of Santiago Creek; as with the proposed project, no disturbance to the north bank of the creek would occur. However, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative proposes development on Area D to Commercial Equestrian Parcel, whereas the proposed project has the same area as Open Space Grasslands. Furthermore, the development of housing on the currently vacant Ridgeline Property would increase geology and soils impacts compared with the proposed project, which does not include development.
of this parcel. Overall, the disturbance would increase the severity of geology and soils. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater geology and soils impacts than the proposed project.

Greenhouse Gas Emissions
The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. Overall, this represents a net increase in development activity relative to the proposed project and, thus, fewer construction emissions of greenhouse gases would occur. Additionally, this alternative would generate fewer daily trips, which would result in fewer operational emissions of greenhouse gases. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have fewer greenhouse gas impacts than the proposed project.

Hazards and Hazardous Material
The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed project. Residential uses would be located in the same location as the proposed project and, therefore, would require similar mitigation measures for vapor intrusion and petroleum-impacted soil. This alternative also proposes the development of housing on the currently vacant Ridgeline Property, previously utilized as commercial and recreational uses, which would increase potential hazards and hazardous material impacts compared with the proposed project, which does not include development of this parcel. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have hazards and hazardous materials impacts greater than the proposed project.

Hydrology and Water Quality
The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and increase of 55.8 acres of disturbance relative to the proposed project. Residential uses would be located in the same location as the proposed project and, therefore, would require similar mitigation measures for water quality and dam failure. As with the proposed project, this alternative would install a storm drainage system and discharge runoff to an on-site detention basin. The Land Use Plan/OPA 2008 “WIN-WIN” Alternative proposes development on Area D to Commercial Equestrian Parcel, whereas the proposed project has the same area as Open Space Grasslands. Additionally, the development footprint of Area C has a larger footprint than the residential footprint in the proposed project. This would result in a net increase of runoff entering the Handy Creek storm drain, which is not capable of conveying runoff from a 100-year storm event under existing conditions. Furthermore, the development of housing on the currently vacant Ridgeline Property would create more hydrology and water quality impacts compared with the proposed project, which does not include development of this parcel. Overall, the net increase in development and disturbance would increase the severity of impacts associated with water quality and drainage. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater hydrology and water quality impacts than the proposed project.
Land Use and Planning

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This alternative would require a corresponding General Plan Amendment to re-designate the site to the contemplated end uses. Additionally, similar to the proposed project the project site would be rezoned to Specific Plan. However, the rezoning for development of housing on the currently vacant Ridgeline Property would increase land use and planning impacts compared with the proposed project, which does not include development of this parcel. Overall, the proposed land use changes would be greater in nature to those of the proposed project. Thus, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater land use and planning impacts than the proposed project.

Mineral Resources

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. The residential uses would be developed on most of the area that supports resource extraction activities and, therefore, would result in the permanent loss of the availability of mineral resources from the project site. However, the project site is considered depleted of economically recoverable aggregate, and the likelihood of sand and gravel operations resuming is low. Thus, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have mineral resources impacts similar to the proposed project.

Noise

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. The active recreation portions of this alternative include soccer fields, softball fields, tennis courts, and a driving range, all of which will contribute to the overall noise environment in the Mabury Ranch, West of Cannon, and Jamestown communities. The development of the Commercial Equestrian Parcel would increase the noise environment to The Reserve community compared with the Open Space Grasslands in the proposed project. Furthermore, the development of housing on the currently vacant Ridgeline Property would increase noise impacts to the Orange Park Acres community compared with the proposed project, which does not include development of this parcel. Overall, this represents a net increase in development activity relative to the proposed project; thus, more construction and operational noise would occur. Additionally, this alternative would generate 779 greater daily trips, which would result in more roadway noise. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater noise impacts than the proposed project.

Population and Housing

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units. Additionally, a portion of the project site is currently designated for residential use, which would be reassigned within the site to allow the development of this alternative; thus, the population increase attributable to this alternative would be considered “planned growth.” The development of housing on the currently vacant Ridgeline Property is included in the 61 dwelling units; however, the housing increase would still be lower than the proposed project.
Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have fewer population and housing impacts than the proposed project.

**Public Services**

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units relative to the proposed project. This would result in a decrease in demand for fire, police, schools, parks, and other public facilities. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have fewer public services impacts than the proposed project.

**Recreation**

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units relative to the proposed project. This would result in a decrease in demand for recreation. This alternative also includes more active recreation uses than the proposed project. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have fewer recreation impacts than the proposed project.

**Transportation and Traffic**

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units (22 one-acre lots on Rio Santiago and 39 one-acre lots on the Ridgeline property) on a total of 77 acres. The remaining 88 acres include active recreation, equestrian and open space. Table 5-5 summarizes the trip generation associated with this alternative. As shown in the table, this alternative would result in a net increase of 779 daily trips, 16 AM peak-hour trips, and 115 PM peak-hour trips. This alternative would require mitigation similar to the proposed project; however, because it generates greater trips during the impacted peak hour, it would increase the severity of transportation impacts when compared to the proposed project.

**Table 5-5: Land Use Plan/OPA 2008 “WIN-WIN” Alternative Trip Generation Comparison**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Net Change in Trips</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Daily</td>
</tr>
<tr>
<td>Land Use Plan/OPA 2008 “WIN-WIN” Alternative</td>
<td>2,007</td>
</tr>
<tr>
<td>Proposed Project</td>
<td>1,228</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>779</td>
</tr>
</tbody>
</table>

Note:
Existing materials and recycling trip generation “netted out”; thus, negative values signify that alternative would generate fewer trips than under existing conditions.
This alternative would also require improvements to the Santiago Canyon Road/Nicky Way intersection, which would provide access to the residential uses developed by this alternative.

Overall, this alternative would generate more daily and peak-hour trips. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater transportation impacts than the proposed project.

Tribal Cultural Resources

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units and an increase of 55.8 acres of disturbance relative to the proposed project. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater tribal cultural resources impacts than the proposed project.

Utilities and Service Systems

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative consists of developing 61 dwelling units on 77 acres and preserving the remaining 88 acres as active recreation and open space. This represents a net reduction of 68 dwelling units relative to the proposed project. This would result in less demand for water, wastewater, solid waste, electricity, and natural gas.

As with the proposed project, this alternative would install a storm drainage system and discharge runoff to an on-site detention basin. However, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative proposes development on Area D to Commercial Equestrian Parcel, whereas the proposed project has the same area as Open Space Grasslands. Additionally, the development footprint of Area C has a larger footprint than the residential footprint in the proposed project. This would result in a net increase of runoff entering the Handy Creek storm drain, which is not capable of conveying runoff from a 100-year storm event under existing conditions. Therefore, the Land Use Plan/OPA 2008 “WIN-WIN” Alternative would have greater utilities and service system impacts than the proposed project.

5.6 - Conclusion

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative would increase the severity of the proposed project’s aesthetics, light, and glare; biological resources; cultural resources; geology and soils; hydrology and water quality; land use and planning; noise; transportation; and tribal cultural resources impacts. However, it would lessen the severity of the proposed project’s air quality; greenhouse gas emissions; population and housing; public services; recreation; and utilities and service systems impacts. This alternative would yield similar impacts for all other topics.

The Land Use Plan/OPA 2008 “WIN-WIN” Alternative would advance most, but not all of the project objectives. This alternative would advance the objectives that positively contribute to the local economy; facilitating the redevelopment of an unsightly, underused resource extraction site; developing new single-family residential dwelling units to meet market demand; guiding the transition of an infill site with a Specific Plan; protecting Santiago Creek by abating the remnants of the resource extraction activities; clustering residential development in the most suitable areas of the project site; protecting Santiago Creek by abating the remnants of the resource extraction
activities; and developing a logical internal circulation system for pedestrians, bicyclists, equestrians, and motorists. However, most of these objectives would be advanced to the same degree as the proposed project because (1) there would be more greenway, open space, and passive recreation uses; (2) the proposed project will not include residential development to the Ridgeline Property; and (3) the project developer is providing the items listed in the preface to the Draft EIR.

5.7 - Environmentally Superior Alternative

The qualitative environmental effects of each alternative in relation to the proposed project are summarized in Table 5-6.

<table>
<thead>
<tr>
<th>Environmental Topic Area</th>
<th>Development within the Existing Land Use Designations Alternative</th>
<th>No Project Alternative/Existing Land Use Activities Alternative</th>
<th>Land Use Plan/OPA 2008 “WIN-WIN” Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetics, Light, and Glare</td>
<td>Greater impact</td>
<td>Greater impact</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Agriculture Resources and Forest Resources</td>
<td>Similar impacts</td>
<td>No impact</td>
<td>Similar impacts</td>
</tr>
<tr>
<td>Air Quality</td>
<td>Fewer impact</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
</tr>
<tr>
<td>Biological Resources</td>
<td>Greater impact</td>
<td>Greater impact</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>Greater impact</td>
<td>Fewer impact</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Geology/Soils</td>
<td>Greater impact</td>
<td>Greater impact</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Greenhouse Gas Emissions</td>
<td>Fewer impact</td>
<td>Fewer impact</td>
<td>Fewer impacts</td>
</tr>
<tr>
<td>Hazards and Hazardous Materials</td>
<td>Similar impacts</td>
<td>Similar impacts</td>
<td>Similar impacts</td>
</tr>
<tr>
<td>Hydrology and Water Quality</td>
<td>Similar Impacts</td>
<td>Fewer impacts</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Land Use and Planning</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Mineral Resources</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Similar impacts</td>
</tr>
<tr>
<td>Noise</td>
<td>Fewer impacts</td>
<td>Greater impact</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Population and Housing</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
</tr>
<tr>
<td>Public Services</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
</tr>
<tr>
<td>Recreation</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
</tr>
<tr>
<td>Tribal Cultural Resources</td>
<td>Greater Impacts</td>
<td>Similar Impacts</td>
<td>Greater Impacts</td>
</tr>
<tr>
<td>Transportation and Traffic</td>
<td>Fewer impacts</td>
<td>Fewer impacts</td>
<td>Greater impacts</td>
</tr>
<tr>
<td>Utilities and Service Systems</td>
<td>Fewer impacts</td>
<td>Greater Impact</td>
<td>Greater impacts</td>
</tr>
</tbody>
</table>

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.
In this case, the No Project Alternative/Existing Land Use Activities Alternative achieves reductions in the severity of proposed project’s impacts across the same number of topical areas. Of the three alternatives, the No Project Alternative/Existing Land Use Activities Alternative achieves the greatest reduction in daily and peak-hour trip generation because it would develop the fewest dwelling units. Therefore, the No Project Alternative/Existing Land Use Activities Alternative is the Environmentally Superior Alternative.

Although the No Project Alternative/Existing Land Use Activities Alternative is the Environmentally Superior Alternative, it would not advance following project objectives: positively contributing to the local economy; facilitating the redevelopment of an unsightly, underused resource extraction site; developing new single-family residential dwelling units to meet market demand; guiding the transition of an infill site with a Specific Plan; protecting Santiago Creek by abating the remnants of the resource extraction activities; clustering residential development in the most suitable areas of the project site; protecting Santiago Creek by abating the remnants of the resource extraction activities; and developing a logical internal circulation system for pedestrians, bicyclists, equestrians, and motorists. However, these objectives would be advanced with the proposed project.
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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.

No significant unavoidable impacts have been identified in this Draft EIR. All impacts were found to be less than significant after mitigation or less than significant with no mitigation required.

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 proposed project would develop 129 dwelling units and, therefore, has the potential to directly induce population growth. Table 6-1 summarizes the population growth attributable to the proposed project.

Table 6-1: Population Growth

<table>
<thead>
<tr>
<th>Dwelling Units</th>
<th>Persons per Dwelling Unit</th>
<th>Project Population Growth</th>
<th>City of Orange’s Population</th>
<th>Project Population Growth as a Percentage of City Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>129</td>
<td>3.07</td>
<td>396</td>
<td>141,420</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Source: FCS, 2016.

As shown in Table 6-1, the proposed project would increase the City’s population by 396 persons, which would represent less than a 1 percent increase relative to the City’s 2016 population estimate of 141,420. This would not be considered a significant population increase.
Furthermore, a portion of the project site is currently designated for residential use by the City of Orange General Plan and Orange Zoning Ordinance. This indicates that the project site has been contemplated to support residential development and, by extension, future population growth. Although the proposed project would include a General Plan Amendment and Rezone to change the land use designations, these changes would merely bolster the master planning of the site to allow a combination of residential, open space, and recreational uses. Thus, the project site would continue to be designated for residential development.

Lastly, the project site is within an urbanized portion of the City of Orange where infrastructure and utilities including roadways, potable water, sewer, electricity, and natural gas are currently available. Thus, the development of the proposed project would not remove a physical barrier to growth that would allow for unplanned growth to occur.

Impacts would be less than significant.

### 6.3 - Significant Irreversible Changes

The environmental effects of the proposed projects are summarized in Section ES, Executive Summary and are analyzed in detail in Section 3, Environmental Impact Analysis of this EIR.

As mandated by the CEQA Guidelines, the EIR 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 new residential, open space, and recreational uses on a 109-acre site within the Orange city limits. Development activities would involve vegetation removal, grading, and the construction of the residential uses. Construction and demolition 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 proposed projects would result in an irretrievable commitment of non-renewable resources, the commitment of these resources would not be significantly inefficient, unnecessary, or wasteful.
The proposed residential uses do not have the potential to cause significant environmental accidents through releases into the environment, as they would not that handle 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 EIR 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.

### 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 latest Title 24 energy efficiency standards went into effect on January 1, 2017.

Pursuant to the California Building Standards Code and the Title 24 Energy Efficiency Standards, the City will review the design and construction components of the project’s Title 24 compliance when specific building plans are submitted.

6.4.2 - Energy Requirements of the Proposed Project

Short-term construction and long-term operational energy consumption are discussed below.

Short-term Construction

The United States Environmental Protection Agency (EPA) regulates nonroad diesel engines that power both mobile equipment (e.g., bulldozers, scrapers, front end loaders, etc.) and stationary equipment (e.g., generators, pumps, compressors, etc.). The EPA has no formal fuel economy standards for nonroad (e.g., construction) diesel engines but does regulate diesel emissions, which indirectly affects fuel economy. In 1994, EPA adopted the first set of emission standards (“Tier 1”) for all new nonroad diesel engines greater than 37 kilowatts (kW) or 50 horsepower. The Tier 1 standards were phased in for different engine sizes between 1996 and 2000, reducing nitrogen oxide ($NO_x$) emissions from these engines by 30 percent. Subsequently, the EPA adopted more stringent emission standards for $NO_x$, hydrocarbons, and particulate matter from new nonroad diesel engines. This program included the first set of standards for nonroad diesel engines less than 37 kW. It also phased in more stringent “Tier 2” emission standards from 2001 to 2006 for all engine sizes and added yet more stringent “Tier 3” standards for engines between 37 and 560 kW (50 and 750 horsepower) from 2006 to 2008. These standards further reduced nonroad diesel engine emissions by 60 percent for $NO_x$ and 40 percent for particulate matter (PM) from Tier 1 emission levels. In 2004, EPA issued the Clean Air Nonroad Diesel Rule. This rule cut emissions from nonroad diesel engines by more than 90 percent, and was phased in between 2008 and 2014. These emission standards are intended to promote advanced clean technologies for nonroad diesel engines that improve fuel combustion, but they also result in slight decreases in fuel economy.

The proposed project would entail 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.

The project site is located within the five-county Los Angeles metropolitan region. Construction equipment is widely available throughout the region and is subject to the aforementioned EPA emissions standards. There are no unusual project characteristics that would necessitate the use of construction equipment that would be less energy-efficient than at comparable construction sites in the region. Therefore, it is expected that construction fuel consumption associated with the project would not be any more inefficient, wasteful, or unnecessary than at other construction sites in the region.
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 (NHTSA) is responsible for establishing additional vehicle standards and for revising existing standards. As of December 2014, NHTSA indicated that the fuel economy of passenger vehicles averaged 34.2 miles per gallon and light trucks averaged 26.2 miles per gallon. Fuel economy for heavy trucks averages 6.5 miles per gallon, although this is not regulated by the NHTSA.

Table 6-2 summarizes annual transportation fuel consumption for all project-related trips at buildout. On an annual basis at buildout, project-related trips would consume 276,430 gallons of gasoline or diesel.

Table 6-2: Transportation Fuel Consumption

<table>
<thead>
<tr>
<th>Vehicle Class</th>
<th>Percent of Fleet</th>
<th>Average Fuel Economy</th>
<th>Vehicle Miles Traveled</th>
<th>Fuel Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>Passenger Vehicles</td>
<td>55.9</td>
<td>34.2</td>
<td>2,819,333</td>
<td>82,437</td>
</tr>
<tr>
<td>Light Trucks/Sport Utility Vehicles</td>
<td>25.4</td>
<td>26.2</td>
<td>1,281,057</td>
<td>48,895</td>
</tr>
<tr>
<td>Heavy Trucks/Other</td>
<td>18.7</td>
<td>6.5</td>
<td>943,140</td>
<td>145,098</td>
</tr>
<tr>
<td>Total</td>
<td>100.0</td>
<td>—</td>
<td>5,043,530</td>
<td>276,430</td>
</tr>
</tbody>
</table>

Note: Other includes urban buses, school buses, and motorhomes.

Building Energy Demand

Southern California Edison (SCE) provides electrical service and Southern California Gas Company provides natural gas service to customers in the City of Orange.

Electricity

SCE, a unit of Edison International, provides electricity to approximately 5 million metered customers within a 50,000 square-mile service area of Southern California. SCE obtains electricity from a variety of sources, including its own generation plants and purchased power from outside sources. SCE has an ownership stake in the Palo Verde Nuclear Generating Station (Arizona) and owns the Big Creek Hydroelectric System (Fresno County). SCE purchases electricity from a variety of outside sources, including natural gas, wind, geothermal, solar, and biomass generation facilities. SCE is currently in the process of implementing several major transmission system improvements in its service area to meet the electrical needs of planned growth.

As discussed in Impact USS-5 in Section 3.17, Utilities and Service Systems, the proposed project is estimated to demand 944,100 kWh of electricity and 5.25 million cubic feet of natural gas at buildout.
on an annual basis. All new non-residential development would be subject to the latest adopted edition of the Title 24 energy efficiency standards, which are among the most stringent in the U.S.

**Natural Gas**

Southern California Gas Company (SoCalGas), a unit of Sempra Energy, provides natural gas service to 5.9 million metered customers within an approximately 20,000 square mile service area located throughout Central and Southern California, excluding San Diego County, Long Beach, and the desert area of San Bernardino County. (The population of the service area is estimated to be 21.6 million.) SoCalGas has interstate pipeline capacity contracts with El Paso Natural Gas Company, Transwestern Pipeline Company, Gas Transmission Northwest, Pacific Gas and Electric Company, and Kern River Gas Transmission Company to supply natural gas. The utility’s system consists of 2,964 miles of transmission and storage pipelines, 49,874 miles of distribution pipelines, and 47,413 miles of service pipelines. SoCalGas operates four underground natural gas storage reservoirs with a combined working capacity of 137 billion cubic feet.

As discussed in Impact USS-5 in Section 3.17, Utilities and Service Systems, the proposed project is estimated to demand 944,100 kWh of electricity and 5.25 million cubic feet of natural gas at buildout on an annual basis. All new non-residential development would be subject to the latest adopted edition of the Title 24 energy efficiency standards, which are among the most stringent in the U.S.
SECTION 7: EFFECTS FOUND NOT TO BE SIGNIFICANT

7.1 - Introduction

This section is based on the Notice of Preparation (NOP), dated March 3, 2017, and contained in Appendix A of this Environmental Impact Report (EIR). The NOP was prepared to identify the potentially significant effects of the proposed projects and was circulated for public review between March 3, 2017 and April 3, 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 EIR topical sections (Sections 3.1 through 3.18) 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 - Aesthetics, Light, and Glare

State Scenic Highways

The nearest officially designated State Scenic Highway to the project site is a 4-mile segment of State Route 91 (SR-91) in Anaheim, located approximately 5 miles to the north. Because of distance and the presence of intervening topography and urban development, the project site is not visible from this segment of SR-91. This condition precludes the possibility of the proposed project adversely affecting scenic resources within view of a State Scenic Highway. No impacts would occur.

7.2.2 - Geology and Soils

Septic or Alternative Wastewater Disposal Systems

The proposed project would be served by sanitary sewer service provided by Orange County Sanitation District; no septic or alternative wastewater disposal systems would be used. This condition precludes the possibility of impacts in this regard. No impacts would occur.

7.2.3 - Hazards and Hazardous Materials

Airports

The project site is 10 miles from the closest airport, Orange County John Wayne Airport. This distance precludes the possibility of exposing persons residing or working in the project vicinity to aviation safety hazards. No impacts would occur.
Private Airstrips
There are no private airstrips in the project vicinity. This condition precludes the possibility of exposing persons residing or working in the project vicinity to aviation safety hazards. No impacts would occur.

7.2.4 - Hydrology and Water Quality

Seiches, Tsunamis, or Mudflows
There are no large inland bodies of water near the project site, a condition that precludes the possibility of seiche inundation. The project site is 16 miles from the Pacific Ocean and therefore is not susceptible to tsunami inundation. The project site does not contain any steep slopes that may be susceptible to mudflows. No impacts would occur.

7.2.5 - Land Use and Planning

Division of an Established Community
The project site contains undeveloped land, remnants of past mining surface operations, and Santiago Creek. There are no dwelling units on the project site. This condition precludes the possibility of division of an established community.

7.2.6 - Noise

Aviation Noise
The project site is 10 miles from the closest airport, Orange County John Wayne Airport. Additionally, there are no private airstrips in the project vicinity. This distance precludes the possibility of exposing persons residing or working in the project vicinity to excessive aviation noise. No impacts would occur.

7.2.7 - Population and Housing

Displacement of Persons or Housing
There are no dwelling units on the project site. This condition precludes the possibility of displacement of persons or housing. No impacts would occur.

7.2.8 - Transportation and Traffic

Air Traffic Patterns
The project site is 10 miles from the closest airport, Orange County John Wayne Airport. This distance precludes the possibility of alterations to air traffic patterns. No impacts would occur.
SECTION 8: PERSONS AND ORGANIZATIONS CONSULTED/LIST OF PREPARERS

8.1 - Persons and Organizations Consulted

8.1.1 - Lead Agency

City of Orange

Community Development Department
Community Development Director ........................................................................................................William Crouch
Senior Planner ................................................................................................................................Robert Garcia
Senior Planner .................................................................................................................................Chad Ortlieb

Fire Department
Captain.............................................................................................................................................Ian MacDonald

Police Department
CPS/TLO .............................................................................................................................................Brad Beyer

8.1.2 - Private Parties and Organizations

City of Orange Sully Miller Liaison Committee
Member ................................................................................................................................................Addison Adams
Member ................................................................................................................................................Tom Davidson
Member ................................................................................................................................................Tom Davidson
Member ................................................................................................................................................Tom Davidson
Member ................................................................................................................................................Tom Davidson
Member ................................................................................................................................................Tom Davidson
Member ................................................................................................................................................Tom Davidson

8.2 - List of Preparers

8.2.1 - Lead Agency

City of Orange

Community Development Department
Community Development Director .........................................................................................................William Crouch
Senior Planner ........................................................................................................................................Robert Garcia
Senior Planner ........................................................................................................................................Chad Ortlieb

8.2.2 - Lead Consultant

FirstCarbon Solutions
Project Director .........................................................................................................................................Jason Brandman
Senior Project Manager ......................................................................................................................Charles Holcombe
Persons and Organizations Consulted/
List of Preparers

City of Orange—Trails at Santiago Creek Specific Plan
Draft EIR

Project Manager ................................................................. Grant Gruber
Assistant Project Manager ..................................................... Bryan S. Moller
SeniorBiologist ....................................................................... Kimberly Boydstun
Senior Air Scientist .............................................................. George Lu
Air Scientist ............................................................................ Ella Li
Senior Noise Analyst ............................................................ Phil Ault
Noise Analyst .......................................................................... Maya Tjahjadi
Archaeologist ......................................................................... Michael Macko
Environmental Analyst .......................................................... Paul Smallman
Environmental Analyst .......................................................... Connor Tindall
Technical Editor ....................................................................... Ed Livingston
Word Processor ......................................................................... Ericka Rodriguez
Graphic/GIS ........................................................................... John De Martino
Reprographics .......................................................................... Octavio Perez

8.2.3 - Technical Consultants

Fuscoe Engineering

Project Manager ........................................................................ Dino Capannelli, P.E.

Linscott, Law, and Greenspan

Principal .................................................................................. Keil Maberry, P.E.
Senior Transportation Engineer ................................................. Daniel Kloos, P.E.
Transportation Engineer II ......................................................... Garrett Milovich

PCR Services

Senior Biologist ........................................................................ Maile Tanaka
SECTION 9: REFERENCES


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