32 **A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher**

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Angela Johnson Phone # 970-412-4777
Affiliation Kidd Biological Inc. E-mail angela@kiddbioinc.com
Site Name SC of Woodcrest Dam Date Report Completed 7/30/24
Was this site surveyed in a previous year? Yes ___ No ___ Unknown ✓
Did you verify that this site name is consistent with that used in previous years? Yes ___ No ___ Not Applicable ✓
If site name is different, what name(s) was used in the past? ___
If site was surveyed last year, did you survey the same general area this year? Yes ✓ No ___ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes ✓ No ___ If no, summarize below.

Management Authority for Survey Area: Federal ___ Municipal/County ___ State ___ Tribal ___ Private ✓
Name of Management Entity or Owner (e.g., Tonto National Forest) ___

Length of area surveyed: 1.8 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

___ Native broadleaf plants (entirely or almost entirely, > 90% native)

✓ Mixed native and exotic plants (mostly native, 50 - 90% native)

___ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

___ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific names.
Salix lasiolepsis, Salix goodingii, Baccharis salicifolia

Average height of canopy (Do not include a range): 6 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections; 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests; 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher Survey and Detection Form (revised April, 2004)

Site Name Woodcrest State CA County Riverside
USGS Quad Name Riverside East Elevation _____ feet / meters (circle one)

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? ☐ ***Yes*** ☐ ***No***

Site Coordinates: Start: N 466878 E 3750556 UTM Datum 11 (NAD27 preferred)
Stop: N 467843 E 3749880 UTM Zone S

***** Fill in additional site information on back of this page *****

Survey # / Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found ? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign, If Yes, Describe Y or N	Comments about this survey (e.g., bird behavior, evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
1 Jill Coumoutso	Date 5/21/24 Start 0600 Stop 0945 Total hrs 3.75	0	0	0	0	N	N	
2	Date Start Stop Total hrs							
3	Date Start Stop Total hrs							
4	Date Start Stop Total hrs							
5 Jill Coumoutso	Date 7/3/24 Start 0557 Stop 0906 Total hrs 3.0	0	0	0	0	N	N	
Overall Site Summary (Total **resident** WIFLs only) Total survey hrs		Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? Yes No If yes, report color combination(s) in the comments section on back of form		

Reporting Individual _____ Date Report Completed _____
US Fish and Wildlife Service Permit #_____ AZ Game and Fish Department (or other state) Permit # _____

Submit original form by August 1st. Retain a copy for your records.

Fill in the following information completely. Submit original form by August 1st. Retain a copy for your records.

Reporting Individual Jill Coumoutso Phone #
Affiliation Kidd Biological, Inc E-mail JCBiological@gmail.com
Site Name Woodcrest TTLC Date Report Completed 7/1/2024

Did you verify that this site name is consistent with that used in previous years? Yes (No) (circle one)
If name is different, what name(s) was used in the past?
If site was surveyed last year, did you survey the same general area this year? Yes / No If no, summarize in comments below.
Did you survey the same general area during each visit to this site this year? Yes (No) If no, summarize in comments below.

Management Authority for Survey Area (circle one): Federal Municipal/County State Tribal (Private)
Name of Management Entity or Owner (e.g., Tonto National Forest) TTLC Management Comany

Length of area surveyed: 1.8 km (specify units, e.g., miles = mi, kilometers = km, meters = m)

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

☐ Native broadleaf plants (entirely or almost entirely, includes high-elevation willow)

☒ Mixed native and exotic plants (mostly native)

☐ Mixed native and exotic plants (mostly exotic)

☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: Salix lasiolepis, S. goodingi, Baccharis salicifolia

Average height of canopy (Do not put a range): 6 meters (specify units)

Was surface water or saturated soil present at or adjacent to site? Yes / No (circle one)
Distance from the site to surface water or saturated soil: (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? Yes (No) (circle one)
If yes, describe in comments section below.

Remember to attach a copy of a USGS quad/topographical map (REQUIRED) of the survey area, outlining the survey site and location of WIFL detections. Also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map. Please include photos of the interior of the patch, exterior of the patch, and overall site and describe any unique habitat features.

Comments (attach additional sheets if necessary)

WIFL Detection Locations:

Date Detected	N UTM	E UTM	Date Detected	N UTM	E UTM

APPENDIX D- SITE PHOTOS

1. Northern survey area

2. Northern survey area

3. Central survey area

4. Central Survey area

5. Southern survey area

6. Southern survey area

WOODCREST PROJECT

RIVERSIDE COUNTY, CALIFORNIA

RIVERSIDE EAST USGS 7.5-MINUTE TOPOGRAPHIC QUADRANGLE
SECTION 24, TOWNSHIP 3 SOUTH, RANGE 5 WEST
APN: 245-300-001 AND -004

Delineation of State and Federal Jurisdictional Waters

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Prepared By:

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Santa Ana, California 92711
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714.716.5050

January 2025

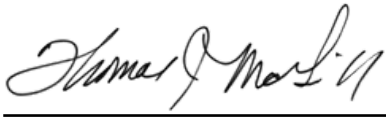
WOODCREST PROJECT

RIVERSIDE COUNTY, CALIFORNIA

Delineation of State and Federal Jurisdictional Waters

The undersigned certify that the statements furnished in this report and exhibits present data and information required for this biological evaluation, and the facts, statements, and information presented is a complete and accurate account of the findings and conclusions to the best of our knowledge and beliefs.

Travis J. McGill
Biologist/Director



Thomas J. McGill, Ph.D.
Managing Director

January 2025

Executive Summary

ELMT Consulting (ELMT) has prepared this Delineation of State and Federal Jurisdictional Waters Report for the proposed Woodcrest Project (project site or site) located within Assessor Parcel Number (APN) 245-300-001 and -004 in unincorporated Riverside County, Riverside County, California within. The jurisdictional delineation documents the regulatory authority of the U.S. Army Corps of Engineers (Corps), the Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Sections 1600 *et. seq.* of the California Fish and Game Code.[1]

Two unnamed drainage features (Drainages 1 and 2) were observed within the boundaries of the project site. Drainage 1 generally flows in a southeast to northwest direction across the middle of the project site, and Drainage 2 flows in an east to west direction across the northwest corner of the project site. The onsite drainage features receive flows via direct precipitation, and from the discharge urban runoff from residential developments upstream. Portions of Drainage 1 support a southern willow scrub plant community. The onsite drainage features are ephemeral drainage features that are not relatively permanent, standing, or a continuously flowing body of water and, therefore, are not expected to qualify as waters of the United States under the regulatory authority of the Corps (*Sackett v. EPA* (2022) 143 S. Ct. 1322, 1336). However, the onsite drainage feature will qualify was waters of the State and fall under the regulatory authority of the Regional Board and CDFW. Table ES-1 identifies the on-site jurisdictional areas including the total acreage of jurisdiction and anticipated impacts for each regulatory agency within the boundaries of the project site.

Table ES-1: Jurisdictional Areas

Jurisdictional Feature	Stream Flow	Cowardin Class	Class of Aquatic Resource	Linear Feet	Regional Board Jurisdiction		CDFW Streambed	
					On-Site Jurisdiction	Impacts	On-Site Jurisdiction	Impacts
Drainage 1	Ephemeral	Riverine	Non-Section 10 Non-Wetland and Wetland	4,795	1.12	0.14	2.24	0.24
Drainage 2	Ephemeral	Riverine	Non-Section 10 Non-Wetland	803	0.25	0.00	0.75	0.0
			TOTALS	**5,598**	**1.37**	**0.14**	**2.99**	**0.24**

[1] The field surveys for this jurisdictional delineation were conducted on January 4, 2022 pursuant to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008); and *Minimum Standards for Acceptance of Aquatic Resources Delineation Reports* (Corps 2017); *The MESA Field Guide: Mapping Episodic Stream Activity* (CDFW 2014); and a *Review of Stream Processes and Forms in Dryland Watersheds* (CDFW 2010).

The project applicant will likely be required to obtain the following regulatory approvals prior to impacts occurring within the identified jurisdictional areas: Corps Approved Jurisdictional Determination/Waiver; Regional Board CWA Section Report of Waste Discharge; and CDFW Section 1602 Streambed Alteration Agreement (SAA). Refer to Sections 1-7 for a detailed analysis of site conditions and regulatory requirements.

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Section 1 Introduction

This delineation has been prepared for the proposed Woodcrest Project located within APN 245-300-001 in unincorporated Riverside County, California (Project) in order to document the potential jurisdictional authority of the U.S. Army Corps of Engineers (Corps), the Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act and Sections 1600 *et seq.* of the California Fish and Game Code. The analysis presented in this report is supported by field surveys and verification of site conditions conducted on January 4, 2022.

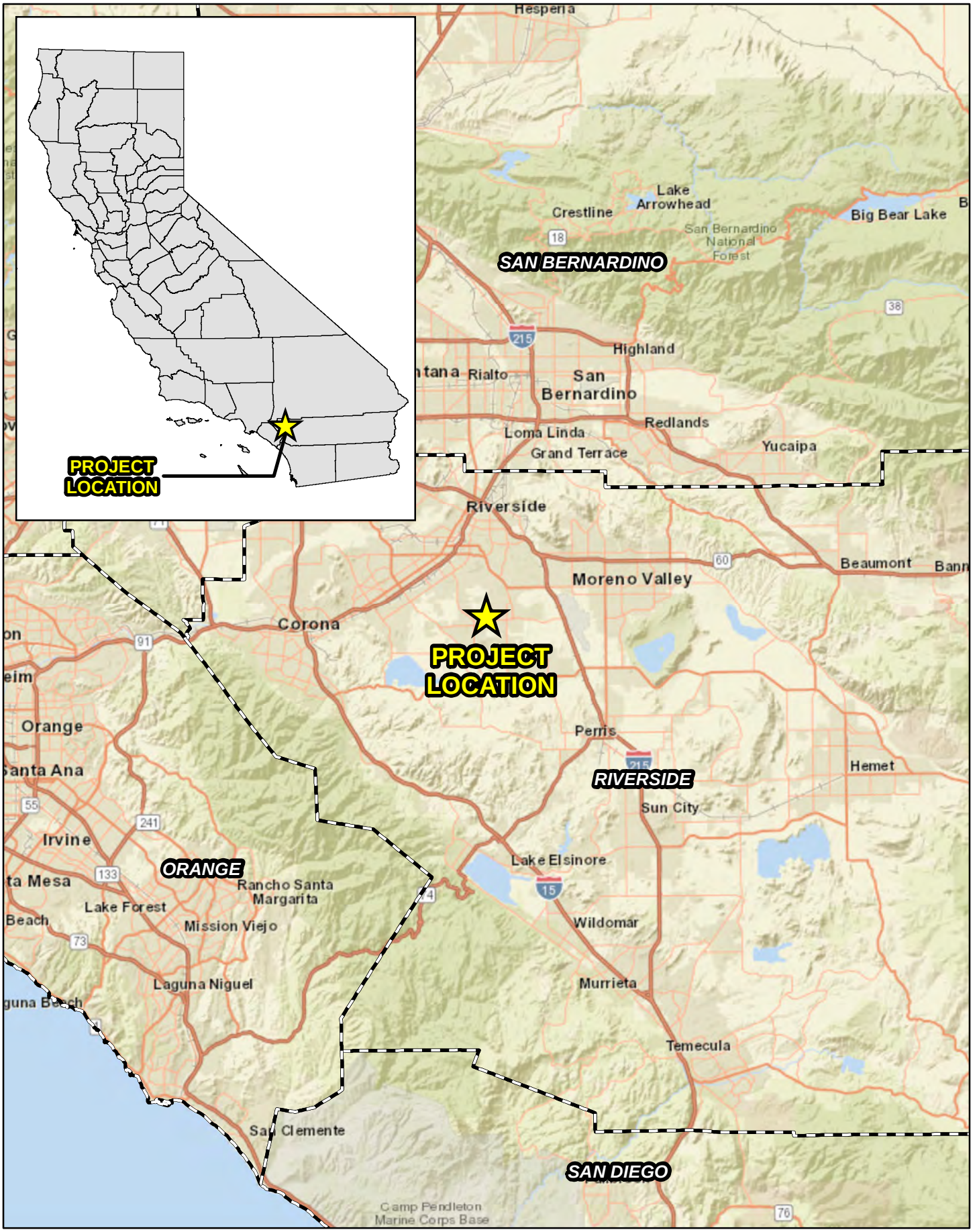
This jurisdictional delineation explains the methodology undertaken by ELMT Consulting (ELMT) to define the regulatory authority of the aforementioned regulatory agencies and documents the findings made by ELMT. This report documents the jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies.

1.1 PROJECT LOCATION

The site is generally located southeast of Interstate 91, west of Interstate 215 and east of Interstate 15 in unincorporated Riverside County California (Exhibit 1, *Regional Vicinity*). The site is depicted on the Riverside East quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series within Section 24 of Township 3 South, Range 5 West (Exhibit 2, *Site Vicinity*). Specifically, the project site is north of Iris Avenue, south of Gentian Avenue, west of Chicago Avenue and east of Porter Avenue within Assessor Parcel Number (APN) 245-300-001 and -004 (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTON

The project proposes to develop a Tentative Tract Map No. 38510 with 231 residential lots. The project will include offsite improvemtns to the frontage road and the rod on the northeast corrner of the site. No temporary impact areas are proposed.



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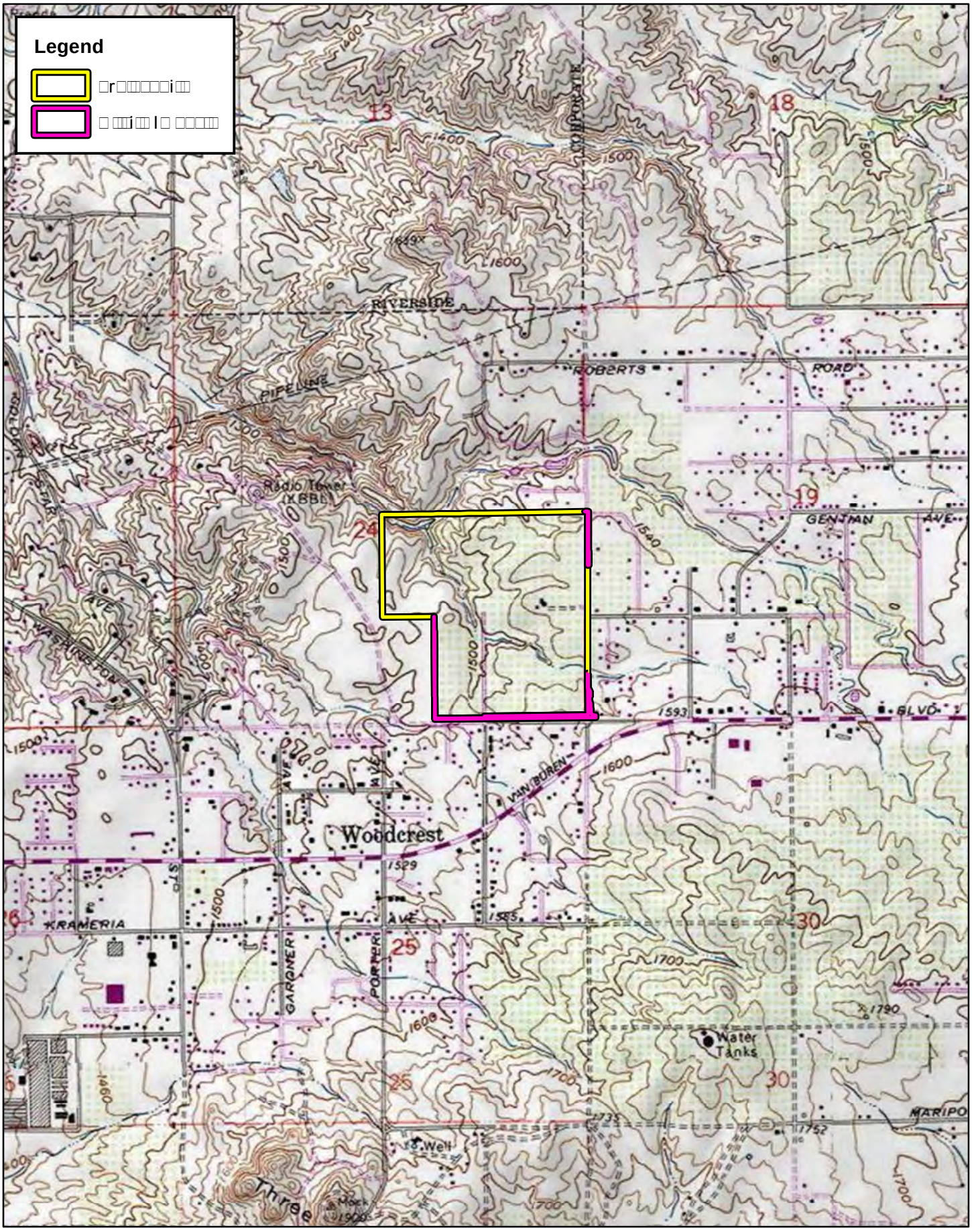

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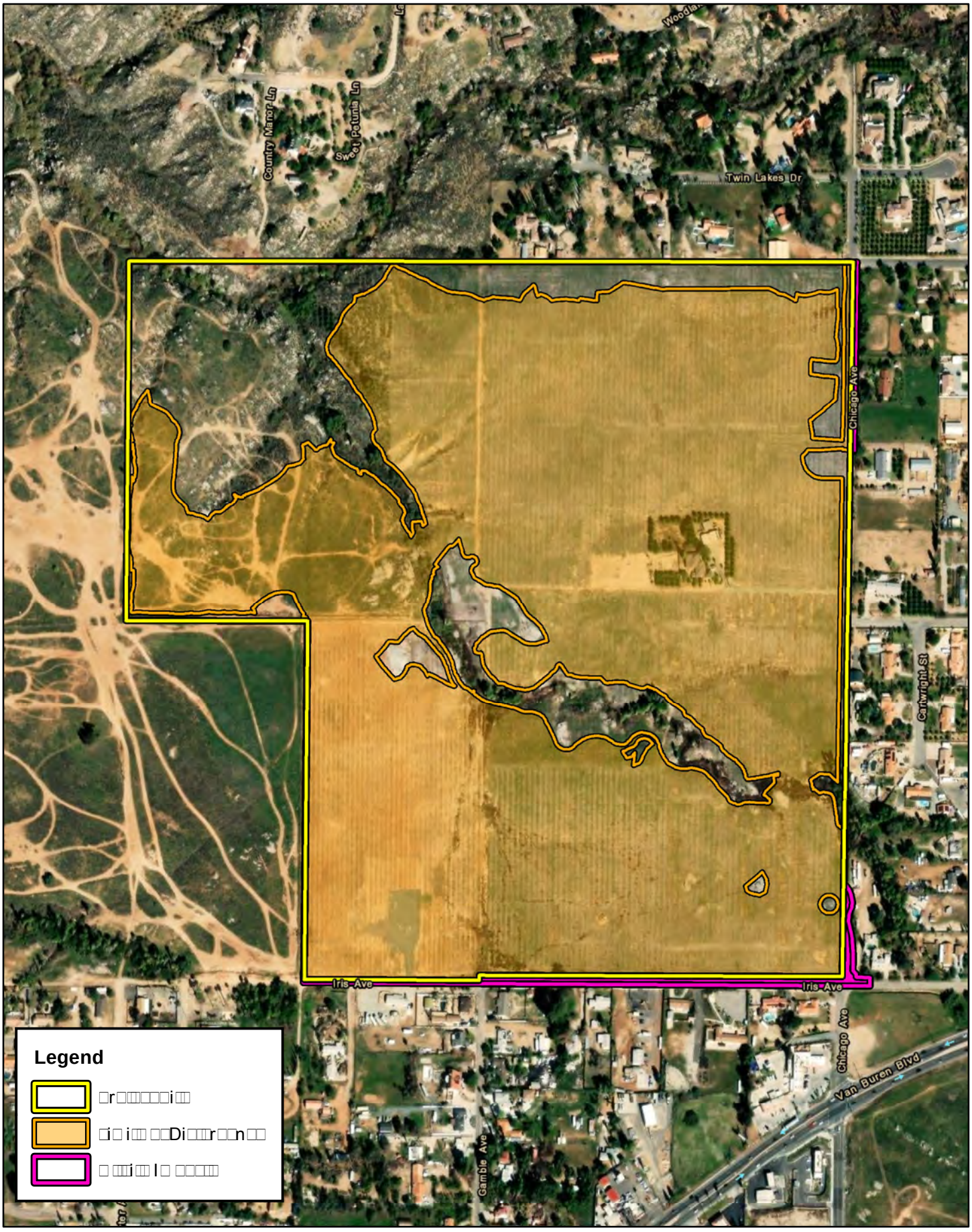

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Section 2 Regulations

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Division regulates activities pursuant to Section 404 of the CWA, Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. The Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates activities under Sections 1600 *et seq*. of the California Fish and Game Code.

2.1 U.S. ARMY CORPS OF ENGINEERS

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States." The terms *waters of the United States* and *wetlands* are defined under CWA Regulations 33 Code of Federal Regulations (CFR) §328.3 (a) through (b).

2.2 REGIONAL WATER QUALITY CONTROL BOARD

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Boards that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board (SWRCB) assumes this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

Additionally, the California Porter-Cologne Water Quality Control Act gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Water Quality Control Act has become an important tool post *Solid Waste Agency of Northern Cook County vs. United States Corps of Engineers*[2] (SWANCC) and *Rapanos v. United States*[3] (Rapanos) court cases with respect to the State's regulatory authority over isolated and insignificant waters. Generally, any applicant proposing to discharge waste into a water body must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any

[2] Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001)
[3] Rapanos v. United States, 547 U.S. 715 (2006)

waste substance associated with human habitation, the Regional Board also interprets this to include discharge of dredged and fill material into water bodies.

Under the State Water Resources Control Board Sate Wetland Definition, an area is a wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

2.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Sections 1600 *et seq.* of the California Fish and Game Code establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not substantially adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided. Pursuant to Section 1602 of the California Fish and Game Code, a notification must be submitted to the CDFW for any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream or use material from a streambed. One CDFW guidance document, although not a formally adopted rule or policy, requires notification for activities taking place within rivers or streams that flow perennially or episodically and that are defined by the area in which surface water currently flows, or has flowed, over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical and biological indicators. If the project will not "substantially adversely affect an existing fish or wildlife resource," following notification to CDFW, the project may commence without an agreement with CDFW. (Fish & G. Code, § 1602(a)(4)(A)(i).)

Section 3 Methodology

The analysis presented in this report is supported by field surveys and verification of site conditions conducted on January 4, 2022. ELMT conducted a field delineation to determine the jurisdictional limits of "waters of the State" and jurisdictional streambed (including potential wetlands), located within the boundaries of the project site. While in the field, jurisdictional features were recorded on an aerial base map at a scale of 1" = 50' using topographic contours and visible landmarks as guidelines. Data points were obtained with a Garmin Map62 Global Positioning System to record and identify specific widths for ordinary high water mark (OHWM) indicators and the locations of photographs, soil pits, and other pertinent jurisdictional features, if present. This data was then transferred as a .shp file and added to the Project's jurisdictional exhibits. The jurisdictional exhibits were prepared using ESRI ArcInfo Version 10 software.

3.1 WATERS OF THE UNITED STATES

In the absence of adjacent wetlands, the limits of the Corps jurisdiction in non-tidal waters extend to the OHWM, which is defined as "*. . . that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*"3F3F[4] Indicators of an OHWM are defined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Corps 2008). In addition to characteristics listed above, wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and/or change in plant community.

In accordance with the Revised Definition of "Waters of the United States"; Conforming (September 8, 2023), "waters of the United Sates" are defined as follows:

(a) ***Waters of the United States*** means:
- (1) Waters which are:
  - (i) Currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
  - (ii) The territorial seas; or
  - (iii) Interstate waters;
- (2) Impoundments of waters otherwise defined as waters of the United States under this definition, other than impoundments of waters identified under paragraph (a)(5) of this section;
- (3) Tributaries of waters identified in paragraph (a)(1) or (2) of this section that are relatively permanent, standing or continuously flowing bodies of water;
- (4) Wetlands adjacent to the following waters:
  - (i) Waters identified in paragraph (a)(1) of this section; or

[4] CWA regulations 33 CFR §328.3(e).

(ii) Relatively permanent, standing or continuously flowing bodies of water identified in paragraph (a)(2) or (a)(3) of this section and with a continuous surface connection to those waters;

(5) Intrastate lakes and ponds not identified in paragraphs (a)(1) through (4) of this section that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraph (a)(1) or (a)(3) of this section

(b) The following are not "waters of the United States" even where they otherwise meet the terms of paragraphs (a)(2) through (5) of this section:

(1) Waste treatment systems, including treatment ponds or lagoons, designed to meet the requirements of the Clean Water Act;

(2) Prior converted cropland designated by the Secretary of Agriculture. The exclusion would cease upon a change of use, which means that the area is no longer available for the production of agricultural commodities. Notwithstanding the determination of an area's status as prior converted cropland by any other Federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA;

(3) Ditches (including roadside ditches) excavated wholly in and draining only dry land and that do not carry a relatively permanent flow of water;

(4) Artificially irrigated areas that would revert to dry land if the irrigation ceased;

(5) Artificial lakes or ponds created by excavating or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing;

(6) Artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating or diking dry land to retain water for primarily aesthetic reasons;

(7) Waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of waters of the United States; and

(8) Swales and erosional features (*e.g.*, gullies, small washes) characterized by low volume, infrequent, or short duration flow.

(c) In this section, the following definitions apply:

(1) ***Wetlands*** means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

(2) ***Adjacent*** means having a continuous surface connection

(3) ***High tide line*** means the line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

(4) ***Ordinary high water mark*** means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

(5) ***Tidal waters*** means those waters that rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by hydrologic, wind, or other effects.

Pursuant to the Corps Wetland Delineation Manual (Corps 1987), the identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of these three parameters. It should also be noted that both the Regional Board and CDFW follow the methods utilized by the Corps to identify wetlands. For this Project , Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008).

3.2 WATERS OF THE STATE

3.2.1 REGIONAL WATER QUALITY CONTROL BOARD

The California *Porter-Cologne Water Quality Control Act* gives the Regional Board very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Regional Board shares the Corps' methodology for delineating the limits of jurisdiction based on the identification of OHWM indicators and utilizing the three parameter approach for wetlands. The Regional Board shares the Corps' jurisdictional methodology, unless SWANCC or Rapanos conditions are present. In the latter case, the Regional Board considers such drainage features to be jurisdictional waters of the State.

3.2.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Sections 1600 *et seq*. of the California Fish and Game Code applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. Generally, the CDFW's jurisdictional limit is not defined by a specific flow event, nor by the presence of OHWM indicators or the path of surface water as this path might vary seasonally. Instead, CDFW's jurisdictional limit is based on the topography or elevation of land that confines surface water to a definite course when the surface water rises to its highest point. Further, the CDFW's jurisdictional limit extends to include any habitat (e.g. riparian), including wetlands and vernal pools, supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. For this project location, CDFW jurisdictional limits were delineated using the methods outlined in the *MESA Field Guide* (Brady, III and Vyverberg 2013) and *A Review of Stream Processes and Forms in Dryland Watersheds* (Vyverberg 2010), which were developed to provide guidance on the methods utilized to describe and delineate episodic streams within the inland deserts region of southern California.

Section 4 Literature Review

ELMT conducted a thorough review of relevant literature and materials to preliminarily identify areas that may fall under the jurisdiction of the regulatory agencies. A summary of materials utilized during ELMT's literature review is provided below and in Appendix B, *Documentation*. In addition, refer to Section 7 for a complete list of references used throughout the course of this delineation.

4.1 WATERSHED REVIEW

The project site is located within the Santa Ana River Watershed (Hydrologic Unit Code 18070203). The watershed includes much of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County, and a small portion of Los Angeles County. The watershed is bound to the south by the Santa Margarita watershed, on the east by the Salton Sea and Southern Mojave watersheds, and on the north/west by the Mojave and San Gabriel watersheds. The watershed is approximately 2,800 square miles in area and substantially urbanized with approximately 32% of the land being residential, commercial, or industrial.

The watershed is located in the Peninsular Ranges and Transverse Ranges Geomorphic Provinces of Southern California (California Geological Survey Note 36). The highest elevations (upper reaches) of the watershed occur in the San Bernardino (San Gorgonio Peak – 11,485 feet in elevation) and eastern San Gabriel Mountains (Transverse Ranges Province; Mt. Baldy – 10,080 feet in elevation) and in the San Jacinto Mountains (Peninsular Ranges Province, Mt. San Jacinto – 10,804 feet in elevation). Further downstream, the Santa Ana Mountains and the Chino Hills form a topographic high before the river flows into the Coastal Plain (in Orange County) and into the Pacific Ocean. Primary slope direction is northeast to southwest, with secondary slopes controlled by local topography.

Tributaries of the Santa Ana River within Riverside County include the San Jacinto River Watershed and the Middle Santa Ana River Watershed. The headwaters of the Santa Ana River are located in the San Bernardino Mountains and include Bear Creek and Mill Creek. Other tributaries include Lytle Creek, originating in the San Gabriel Mountains, and the San Jacinto River, originating in the San Jacinto Mountains. These main tributaries come together to form the Santa Ana River in the San Bernardino Valley, located at the southern base of the Transverse Ranges of the San Bernardino Mountains. The Santa Ana River flows through the San Bernardino Valley before traversing through the Santa Ana Mountains and flowing to the Orange Coastal Plain. The Santa Ana River eventually discharges to the Pacific Ocean in the City of Huntington Beach.

4.2 LOCAL CLIMATE

Riverside County features a somewhat cooler version of a Mediterranean climate, or semi-arid climate, with warm, sunny, dry summers and cool, rainy, mild winters. Relative to other areas in southern California, winters are colder with chilly to cold morning temperatures common. Climatological data obtained for the City of Perris, directly adjacent to March Air Reserve Base, indicates the annual precipitation averages 11.4 inches per year. Almost all of the precipitation occurs in the months between December and March, with hardly any occurring between the months of April and November. The wettest month is February, with a

monthly average total precipitation of 2.86 inches. The average maximum and minimum temperatures for the City of Perris are 80.9 and 46.8 degrees Fahrenheit (F) respectively with July and August being the hottest months (monthly average high 98.0° F) and December being the coldest (monthly average low 34.0° F). Temperatures during the site visits were in the mid-60s° F with light winds and little to no cloud cover.

4.3 USGS TOPOGRAPHIC QUADRANGLE

The USGS 7.5 Minute Series Topographic Quadrangle maps show geological formations and their characteristics, describing the physical setting of an area through contour lines and major surface features including lakes, rivers, streams, buildings, landmarks, and other factors that may fall under an agency's jurisdiction. Additionally, the maps depict topography through color and contour lines, which are helpful in determining elevations and latitude and longitude within the project site.

The site is depicted on the Riverside East quadrangle of the USGS 7.5-minute topographic map series within Section 24 of Township 3 South, Range 5 West.

According to the topographic map, the project site consists entirely of vacant/undeveloped land that historically supported agricultural activities. The project site ranges in elevation from 1,415 to 1,550 feet above mean sea level. The eastern half of the project site is relatively flat with the exception of the drainage feature on the southern portion of the eastern half that flows through an area lower in elevation. The western half of the project site generally slopes from south to north towards the drainage feature that extends from the southeast corner of the western half to the northwest corner of the project site. A historic bluelines streams is observed in within the area of lower elevation, where the drainage features were observed. have been mapped onsite, but one was observed, northwest of the project site, west of Interstate 215.

4.4 AERIAL PHOTOGRAPHS

Prior to conducting the field delineation, ELMT reviewed current and historical aerial photographsof the project as available from Google Earth Pro Imagery and HistoricAerils.com. Aerial photographs can be useful during the delineation process, as they often indicate the presence of drainage features and riverine habitat within the boundaries of the project site, if any.

The site was historically supported an active orchard as well as undeveloped disturbed areas associated with unauthorized off-road vehicle use in the western portion of the project site. Adjacent land uses include rural residential development to the north, south, and east, and undeveloped open space to the west. The orange trees were removed from the project site between 2020 and 2021. The trees were run through a chipper onsite and the chips were evenly spread over the site. The chips have kept the site from revegetating. Chips were not placed on the western portion of the site. Most the western is disturbed and supports non-native grasses.

Due to several decades of agricultural use, those open areas previously associated with the orchard do not support native plant communities or natural communities of special concern. Overall, the project site supports one (1) land cover types that would be classified as disturbed. The large arroyo that runs through the site support native riparian habitat (southern willow scrub) and wetland habitat (freshwater marsh), as well as Riversidean sage scrub along the banks of the arroyo. The southern will scrub habitat has been

invaded by several non-native species such as Washingtonian palm trees and salt cedar throughout most of its length.

4.5 SOILS

Soils within and adjacent to the Project site were researched prior to the field delineation using the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Custom Soil Resource Report for Riverside County. Soil surveys furnish soil maps and interpretations originally needed in providing technical assistance to farmers and ranchers; in guiding other decisions about soil selection, use, and management; and in planning, research, and disseminating the results of the research. In addition, soil surveys are now heavily utilized in order to obtain soil information with respect to potential wetland environments and jurisdictional areas (i.e., soil characteristics, drainage, and color).

Based on the NRCS USDA Web Soil Survey, the project site is underlain by the following soil units: Bonsall fine sandy loam, Cieneba sandy loam, Cieneba rocky sandy loam, Fallbrook sandy loam, Fallbrook fine sandy loam, Monserate sandy loam, and Vista coarse sandy loam. Soils majority of the on-site have been mechanically disturbed and heavily compacted from historic land uses (i.e., agricultural activities). A description of the soils found onsite is provided below:

- The Bonsall series consists moderately well drained soils occurring on uplands and have slopes of 2 to 15 percent. These soils formed in material deeply weathered from granodiorite or tonalite. Vegetation is mainly annual grasses, forbs, and chamise.

- The Cieneba series consists of shallow, somewhat excessively drained soils with low to high runoff, moderately rapid permeability in the soil and much slower permeability in the weathered bedrock. These soils formed in material weathered from granitic rock. Cieneba soils are on hills and mountains and have slopes of 9 to 85 percent. Vegetation is mainly chaparral and chamise with widely spread foothill pine or oak tree. There are small areas of thin annual grasses and weeds.

- The Fallbrook series consists of well-drained soils that lie on uplands and have slopes of 2 to 50 percent. These soils developed on granodiorite and tonalite. The vegetation associated with the soil series is annual grasses, oaks, flat-top buckwheat, and chaparral.

- The Monserate series consists of well-drained soils that developed in alluvium from predominantly granitic material. These soils are typically found on terraces and old alluvial fans with slopes that range from 0 to 25 percent. The vegetation associated with the soil series is annual grasses, forbs, and chamise.

- The Vista series consist of well-drained soils of uplands with slopes ranging from 2 to 35 percent. These soils developed on weathered granite and granodiorite. Vegetation is typically annual grasses, forbs, and chaparral. In a few areas, the plant cover is oak woodland with an understory of grasses.

4.6 HYDRIC SOILS LIST OF CALIFORNIA

ELMT reviewed the USDA NRCS Hydric Soils List of California in an effort to verify whether on-site soils are considered to be hydric[5]. It should be noted that lists of hydric soils along with soil survey maps provide off-site ancillary tools to assist in wetland determinations, but they are not a substitute for field investigations. The presence of hydric soils is initially investigated by comparing the mapped soil series for the site to the County list of hydric soils. According to the hydric soils list, only Bonsall fine sandy loam is listed as a hydric soil in Riverside County.

4.7 NATIONAL WETLANDS INVENTORY

ELMT reviewed the U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory maps. Based on this review, two (2) riverine resources have been mapped on the project site that follow on-site topography (refer to Appendix B, *Documentation*). These two riverine resources correspond to the two drainage features on-site.

4.8 FLOOD ZONE

The Federal Emergency Management Act (FEMA) website was searched for flood data for the project site. Based on Flood Insurance Rate Map No. 0605C0740G the site is located within Zone X – areas with minimal risk of flooding. Refer to Appendix B, *Documentation*.

[5] A hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

Section 5 Site Conditions

ELMT biologist Travis J. McGill conducted a field delineation on November 23, 2021 to verify existing site conditions and document the extent of potential jurisdictional areas within the boundaries of the project site. ELMT field staff encountered no limitations during the field delineation.

5.1 ON-SITE FEATURES

5.1.1 DRAINAGE FEATURES

Drainage 1

Drainage 1 is the longest drainage feature on the project site. It flows from southeast to northwest as it bisects the project site and converges with Drainage 2 near the northwest corner of the site, and supports a sparse southern willow scrub plant community. The drainage enters the site from an earthen channel at the southeastern corner of the project site and flows ephemeral. The onsite drainage features receive flows via direct precipitation, and from the discharge urban runoff from residential developments upstream. Drainage 1 is approximately 4,795 linear feet with an average OHWM that ranges from 2 to 13 feet wide.

The drainage feature that bisects the project site primarily supports a southern willow scrub plant community. This plant community is dominated by arroyo willow (*Salix lasiolepsis*) and black willow (*Salix goodingii*) and supports a variety of other trees and shrubs with an herbaceous understory. Other common species observed in the southern willow scrub plant community include Mexican fan palm (*Washingtonia robusta*), salt cedar (*Tamarix* sp.), giant creek nettle, mule fat, elderberry (*Sambucus mexicana* [*S. caerulea*]), bowlesia (*Bowlesia incana*), California bee plant (*Scrophularia californica*), common phacelia (*Phacelia distans*), Douglas' nightshade (*Solanum douglasii*), goldfields (*Lasthenia glabrata*), hairy leaved sunflower (*Helianthus annuus*), London rocket (*Sisymbrium irio*), needle goldfields (*Lasthenia gracilis*), stinknet (*Oncosiphon pilulifer*), virgin's bower (*Clematis pauciflora*), barley (*Hordeum murinum*), and willow baccharis (*Baccharis salicina*).

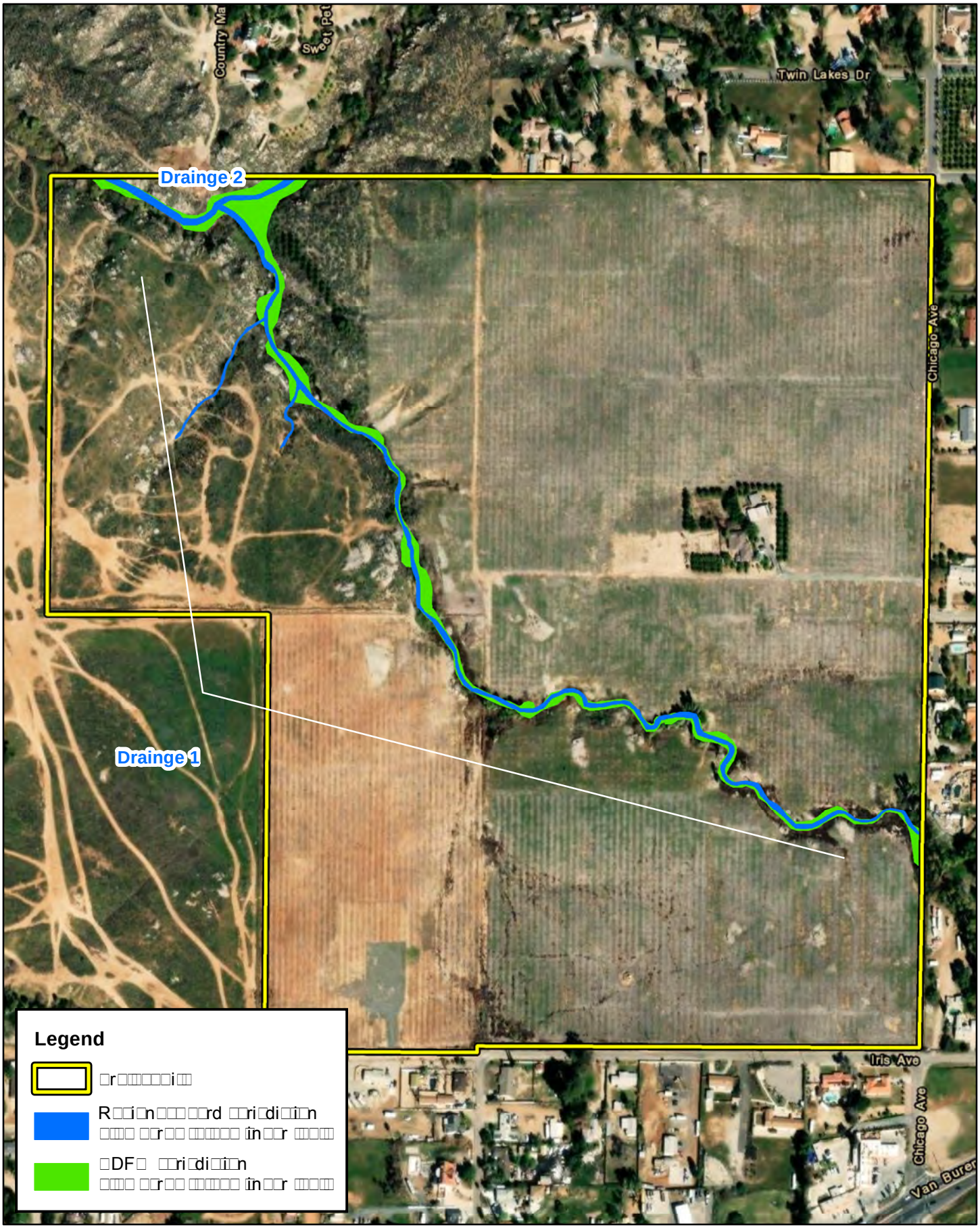
There are two smaller drainages that are part of Drainage 1 on the northwest portion of the site. These two features are small features that follow on-site topography and connect into Drainage 1. They are ephemeral features with no hydrophytic vegetation or soils.

Drainage 2

Drainage 2 is located on the northwest corner of the project site and flows in an east-west direction. The segment of the drainage that occurs within the project site is approximately 803 linear feet with an average OHWM that ranges from 12 to 18 feet wide. Flows originate east of the project site and convey natural runoff, agricultural runoff, and nuisance flows from the surrounding residential developments. Water flows through the drainage quickly and there is evidence of scouring during large storm events. Although the drainage supports a stand of southern willow scrub, there is little to no vegetation with the active channel (within the OHWM).The feature is an earthen channel with clearly defined bed and banks that conveys flows all year round. The unnamed drainage feature supports a southern willow scrub vegetation community characterized by arroyo willow (*Salix lasiolepis*; FACW) and mule fat (*Baccharis salicifolia*; FAC).

5.1.2 WETLAND FEATURES

In order to qualify as a wetland, a feature must exhibit all three wetland parameters (i.e., vegetation, soils, and hydrology) described in the Corps Arid West Regional Supplement. Although evidence of hydrology (i.e., scour, changes in substrate, shelving) was present within the onsite drainage, this area was primarily dominated by nonnative plant species. Further, water does not persist long enough within the project site to create hydric soil (anaerobic) conditions, and the onsite drainage does not supported a dominance of hydrophytic vegetation. As a result, the drainage feature onsite does not meet the Corps' or Regional Board's wetland definition to qualify as jurisdictional wetlands.



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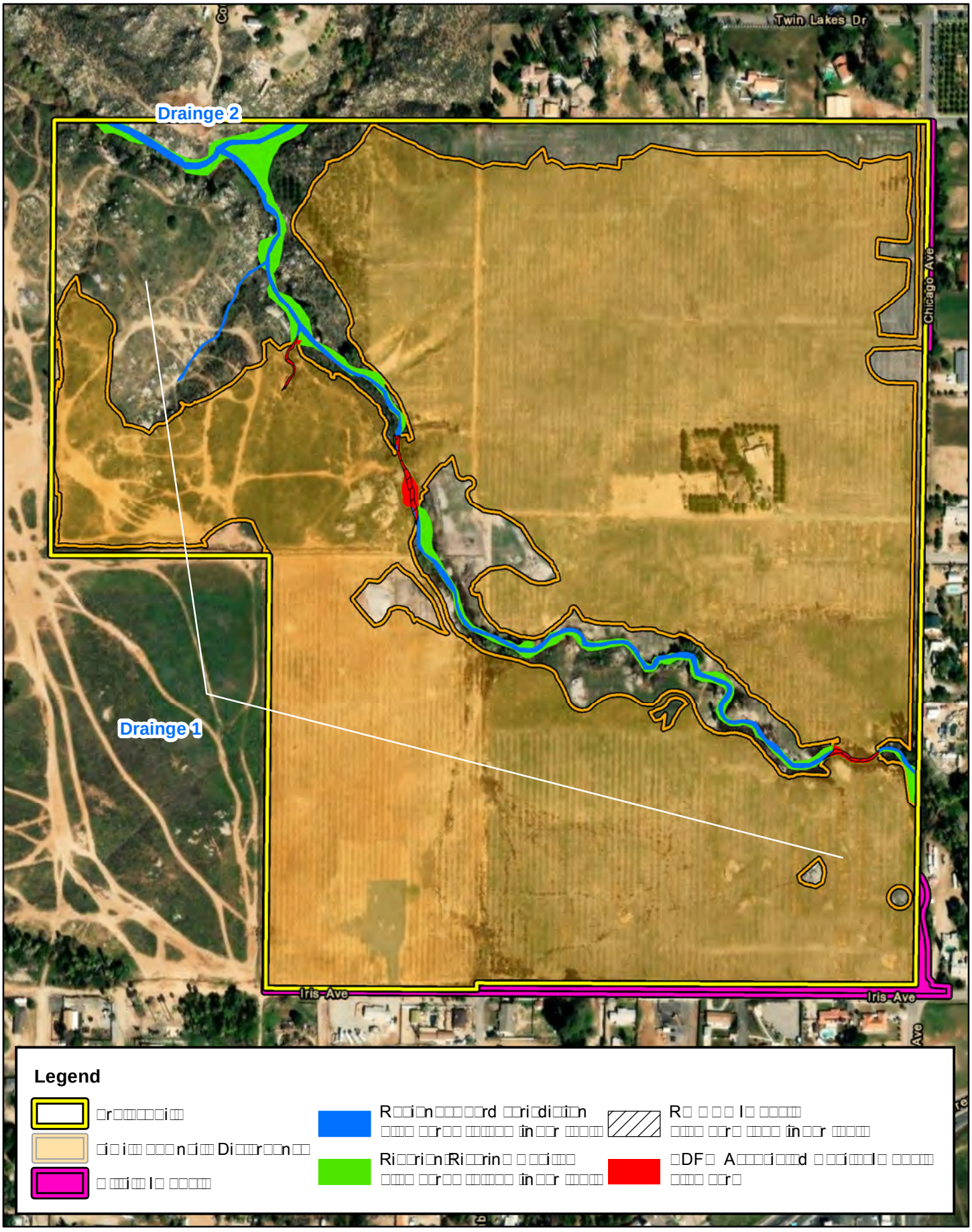

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Section 6 Findings

This report presents the extent of jurisdictional features using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Please refer to the following sections for a summary of jurisdictional areas within the Project site.

6.1 U.S. ARMY CORPS OF ENGINEERS DETERMINATION

6.1.1 WATERS OF THE UNITED STATES DETERMINATION

The onsite ephemeral drainage feature is not relatively permanent, standing, or continuously flowing body of water and, therefore, will not qualify as waters of the United States under the regulatory authority of the Corps (*Sackett v. EPA* (2022) 143 S. Ct. 1322, 1336).

6.2 REGIONAL WATER QUALITY CONTROL BOARD

Drainage 1 exhibits characteristics consistent with the Regional Board's methodology and would likely be considered jurisdictional waters of the State. Approximately 1.37 acre (5,598 linear feet) of Regional Board jurisdiction is located within the boundaries of the project site. Based on the proposed project footprint, approximately 0.14 acre of Regional Board waters of the State will be impacted from project implementation within Drainage 1. Refer to Table 1 for a summary of on-site jurisdictional areas, and Exhibits 5 and 6, for an illustration of on-site Regional Board jurisdictional areas and anticipated impacts.

Table 1: Regional Board Jurisdictional Waters

Jurisdictional Feature	Linear Feet	Regional Board Jurisdiction	
		On-Site Jurisdiction	Impacts
Drainage 1	4,795	1.12	0.14
Drainage 2	803	0.25	0.00
TOTAL	**5,598**	**1.37**	**0.14**

6.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Drainages 1 and 2 exhibit characteristics consistent with CDFW's methodology and would be considered CDFW streambed/riparian totaling approximately 2.99 acres (5,598 linear feet) within boundaries of the project site. Based on the proposed project footprint, approximately 0.24 acre of CDFW streambed will be impacted from project implementation within Drainage 1. Refer to Table 2 for a summary of on-site jurisdictional areas, and Exhibits 5 and 6, for an illustration of on-site CDFW jurisdictional areas and anticipated impacts.

Table 2: CDFW Jurisdictional Streambed

Jurisdictional Feature	Linear Feet	CDFW Jurisdiction	
		On-Site Jurisdiction	Impacts
Drainage 1	4,795	2.24	0.24
Drainage 2	803	0.75	0.00
TOTAL	**5,598**	**2.99**	**0.24**

Section 7 Regulatory Approval Process

The following is a summary of the various permits, certifications, and agreements that may be necessary prior to construction and/or alteration within jurisdictional areas. Ultimately the regulatory agencies make the final determination of jurisdictional boundaries and permitting requirements.

7.1 U.S. ARMY CORPS OF ENGINEERS

The Corps regulates discharges of dredged or fill materials into waters of the United States and wetlands pursuant to Section 404 of the CWA. No Corps jurisdictional areas were identified within the project site and a CWA Section 404 permit would not be required for the proposed project.

7.2 REGIONAL WATER QUALITY CONTROL BOARD

The Regional Board regulates discharges to surface waters pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act. Any impacts to on-site jurisdictional areas will require a Report of Waste Discharge prior to project implementation. Therefore, it will be necessary for the applicant to acquire a Report of Waste Discharge prior to impacts occurring within Regional Board jurisdictional areas. The Regional Board also requires that California Environmental Quality Act (CEQA) compliance be obtained prior to obtaining the 401 Certification. A Regional Board Application fee is required with the application package and is calculated based on the acreage and linear feet of jurisdictional impacts.

7.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Pursuant to Section 1602 of the California Fish and Game Code, the CDFW regulates any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream. Therefore, impacts to the on-site jurisdictional areas will require a Section 1602 Streambed Alteration Agreement from the CDFW prior to project implementation. The notification will require a processing fee which is based on the term and cost of the proposed Project. It should also be noted that the CDFW requires that the payment of the process fee be paid and CEQA compliance be obtained prior to the issuance of the final Section 1602 Streambed Alteration Agreement.

7.4 RECOMMENDATIONS

This report presents ELMT's best effort at determining the extent of jurisdictional features using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Please refer to the following sections for a summary of jurisdictional areas within the project site.

Section 8 References

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Appendix A Site Photographs

Photograph 1: Looking north at the riparian habitat within the arroyo as it enter the project site at the northern boundary.

Photograph 2: Looking west across the arroyo at the northwest portion of the site. Note the patches of Riversidean Sage Scrub (RSS) habitat at the top center of the photo.

Photograph 3: Marshy habitat in the southern portion of the arroyo before the arroyo turns east

Photograph 4: Palm trees, an invasive non-native species, within the eastern portion of the arroyo

Photograph 5: Looking north across the eastern portion of the arroyo before it exits the project site at the southeast corner.

Appendix B Documentation

U.S. Fish and Wildlife Service

National Wetlands Inventory

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NOTES TO USERS

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Flood Elevations shown on this map apply only landward of n Vertical Datum of 1988 (NAVD 88). Users of this FIRM should astal flood elevations are also provided in the Summary of ns tables in the Flood Insurance Study report for this jurisdiction. in the Summary of Stillwater Elevations tables should be used for r floodplain management purposes when they are higher than wn on this FIRM.

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in Special Flood Hazard Areas may be protected by **flood res**. Refer to Section 2.4 "Flood Protection Measures" of the Study report for information on flood control structures for this

sed in the preparation of this map was Universal Transverse ne 11. The **horizontal datum** was NAD 83, GRS80 spheroid. um, spheroid, projection or UTM zones used in the production of nt jurisdictions may result in slight positional differences in map jurisdiction boundaries. These differences do not affect the RM.

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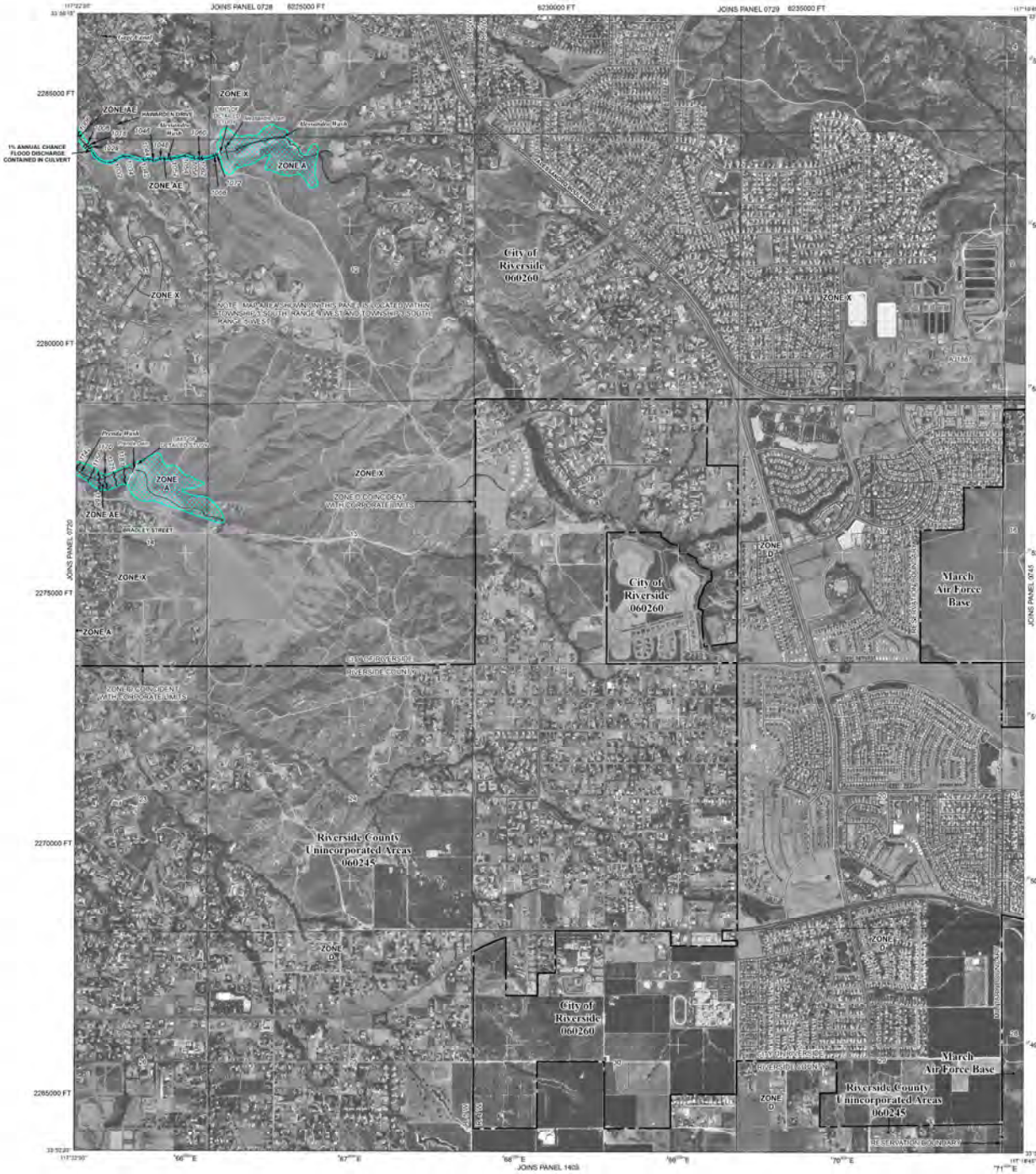
reflect more detailed and up-to-date **stream channel** an those shown on the previous FIRM for this jurisdiction. The odways that were transferred from the previous FIRM may have conform to these new stream channel configurations. As a result, and Floodway Data in the Flood Insurance Study Report (which ive hydraulic data) may reflect stream channel distances that shown on this map.

shown on this map are based on the best data available at the . Because changes due to annexations or de-annexations may e this map was published, map users should contact appropriate s to verify current corporate limit locations.

e separately printed **Map Index** for an overview map of the he layout of map panels; community map repository addresses; Communities table containing National Flood Insurance Program mmunity as well as a listing of the panels on which each ded.

A Map Service Center at 1-800-358-9616 for information on s associated with this FIRM. Available products may include Letters of Map Change, a Flood Insurance Study report, and/or this map. The FEMA Map Service Center may also be reached 66-9620 and its website at http://msc.fema.gov.

ions about this map or questions concerning the National Flood h in general, please call **1-877-FEMA MAP** (1-877-336-2627) or bsite at http://www.fema.gov.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A — No Base Flood Elevations determined.

ZONE AE — Base Flood Elevations determined.

ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.

ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE AR — Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 — Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

ZONE VE — Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

0.2% annual chance floodplain boundary

Floodway boundary

Zone D boundary

CBRS and OPA boundary

Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.

513 — Base Flood Elevation line and value; elevation in feet*

(EL. 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

A — A — Cross section line

B — B — Transect line

87°07'45", 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone 11N

600000 FT — 5000-foot grid ticks: California State Plane coordinate system, zone VI (FIPSZONE 0406), Lambert conformal conic projection

DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)

M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0740

FIRM

FLOOD INSURANCE

RIVERSIDE COUN
CALIFORNIA
AND INCORPORATED A

PANEL 740 OF 3805
(SEE MAP INDEX FOR FIRM P

CONTAINS:

COMMUNITY	NUMBER
RIVERSIDE COUNTY	
RIVERSIDE, CITY OF	

Notice to User: The **Map Number** shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

EFFE
AUG

Federal Emergency Manag

Appendix C Methodology

WATERS OF THE UNITED STATES

In accordance with the Revised Definition of "Waters of the United States" (March 20, 2023), "waters of the United Sates" are defined as follows:

> The ''waters of the United States'' are defined in paragraph (a) of this rule:
>
> (1) traditional navigable waters, the territorial seas, and interstate waters;
>
> (2) impoundments of ''waters of the United States'';
>
> (3) tributaries to traditional navigable waters, the territorial seas, interstate waters, or impoundments when the tributaries meet either the relatively permanent standard or the significant nexus standard (''jurisdictional tributaries'');
>
> (4) wetlands adjacent to traditional navigable waters; wetlands adjacent to and with a continuous surface connection to relatively permanent paragraph impoundments or to jurisdictional tributaries when the jurisdictional tributaries meet the relatively permanent standard; and wetlands adjacent to impoundments or jurisdictional tributaries when the wetlands meet the significant nexus standard (''jurisdictional adjacent wetlands''); and
>
> (5) intrastate lakes and ponds, streams, or wetlands not identified in (1) through (4) above that meet either the relatively permanent standard or the significant nexus standard.

The ''relatively permanent standard'' means relatively permanent, standing or continuously flowing waters connected to traditional navigable waters, and waters with a continuous surface connection to such relatively permanent waters or to traditional navigable waters. The ''significant nexus standard'' means waters that, either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of traditional navigable waters, the territorial seas, or interstate waters.

WETLANDS

For this project location, Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008). This document is one of a series of Regional Supplements to the Corps Wetland Delineation Manual (Corps 1987). The identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. In order to be considered a wetland, an area must exhibit at least minimal characteristics within these three (3) parameters. The Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. In the field, vegetation, soils, and evidence of hydrology are examined using the methodology listed below and documented on Corps wetland data sheets, when applicable. It should be noted that both the Regional Board and the CDFW jurisdictional wetlands encompass those of the Corps.

Vegetation

Nearly 5,000 plant types in the United States may occur in wetlands. These plants, often referred to as hydrophytic vegetation, are listed in regional publications by the U.S. Fish and Wildlife Service (USFWS). In general, hydrophytic vegetation is present when the plant community is dominated by species that can tolerate prolonged inundation or soil saturation during growing season. Hydrophytic vegetation decisions are based on the assemblage of plant species growing on a site, rather than the presence or absence of particular indicator species. Vegetation strata are sampled separately when evaluating indicators of hydrophytic vegetation. A stratum for sampling purposes is defined as having 5 percent or more total plant cover. The following vegetation strata are recommended for use across the Arid West:

- *Tree Stratum:* Consists of woody plants 3 inches or more in diameter at breast height (DBH), regardless of height;
- *Sapling/shrub stratum:* Consists of woody plants less than 3 inches DBH, regardless of height;
- *Herb stratum:* Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size; and,
- *Woody vines:* Consists of all woody vines, regardless of size.

The following indicator is applied per the test method below.[1] Hydrophytic vegetation is present if any of the indicators are satisfied.

Indicator 1 – Dominance Test

Cover of vegetation is estimated and is ranked according to their dominance. Species that contribute to a cumulative total of 50% of the total dominant coverage, plus any species that comprise at least 20% (also known as the "50/20 rule") of the total dominant coverage, are recorded on a wetland data sheet. Wetland indicator status in California (Region 0) is assigned to each species using the *National Wetland Plant List, version 2.4.0* (Corps 2012). If greater than 50% of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation is considered to be met. Plant indicator status categories are described below:

- *Obligate Wetland (OBL):* Plants that almost always occur in wetlands;
- *Facultative Wetland (FACW):* Plants that usually occur in wetlands, but may occur in non-wetlands;
- *Facultative (FAC):* Plants that occur in wetlands and non-wetlands;

[1] Although the Dominance Test is utilized in the majority of wetland delineations, other indicator tests may be employed. If one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present, then the Prevalence Test (Indicator 2) may be performed. If the plant community satisfies the Prevalence Test, then the vegetation is hydric. If the Prevalence Test fails, then the Morphological Adaptation Test may be performed, where the delineator analyzes the vegetation for potential morphological features.

- *Facultative Upland (FACU):* Plants that usually occur in non-wetlands, but may occur in wetlands; and,

- *Obligate Upland (UPL):* Plants that almost never occur in wetlands.

Hydrology

Wetland hydrology indicators are presented in four (4) groups, which include:

Group A – Observation of Surface Water or Saturated Soils

Group A is based on the direct observation of surface water or groundwater during the site visit.

Group B – Evidence of Recent Inundation

Group B consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.

Group C – Evidence of Recent Soil Saturation

Group C consists of indirect evidence that the soil was saturated recently. Some of these indicators, such as oxidized rhizospheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

Group D – Evidence from Other Site Conditions or Data

Group D consists of vegetation and soil features that indicate contemporary rather than historical wet conditions, and include shallow aquitard and the FAC-neutral test.

If wetland vegetation criteria is met, the presence of wetland hydrology is evaluated at each transect by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil test pits. The lateral extent of the hydrology indicators are used as a guide for locating soil pits for evaluation of hydric soils and jurisdictional areas. In portions of the stream where the flow is divided by multiple channels with intermediate sand bars, the entire area between the channels is considered within the OHWM and the wetland hydrology indicator is considered met for the entire area.

Soils

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper 16-20 inches.[2] The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the

[2] According to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008), growing season dates are determined through on-site observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature.

concept of hydric soils. It should also be noted that the limits of wetland hydrology indicators are used as a guide for locating soil pits. If any hydric soil features are located, progressive pits are dug moving laterally away from the active channel until hydric features are no longer present within the top 20 inches of the soil profile.

Once in the field, soil characteristics are verified by digging soil pits along each transect to an excavation depth of 20 inches; in areas of high sediment deposition, soil pit depth may be increased. Soil pit locations are usually placed within the drainage invert or within adjoining vegetation. At each soil pit, the soil texture and color are recorded by comparison with standard plates within a *Munsell Soil Chart* (2009). Munsell Soil Charts aid in designating color labels to soils, based by degrees of three simple variables – hue, value, and chroma. Any indicators of hydric soils, such as organic accumulation, iron reduction, translocation, and accumulation, and sulfate reduction, are also recorded.

Hydric soil indicators are present in three groups, which include:

All Soils

"All soils" refers to soils with any United States Department of Agriculture (USDA) soil texture. Hydric soil indicators within this group include histosol, histic epipedon, black histic, hydrogen sulfide, stratified layers, 1 cm muck, depleted below dark surface, and thick dark surface.

Sandy Soils

"Sandy soils" refers to soil materials with a USDA soil texture of loamy fine sand and coarser. Hydric soil indicators within this group include sandy mucky mineral, sandy gleyed matrix, sandy redox, and stripped matrix.

Loamy and Clayey Soils

"Loamy and clayey soils" refers to soil materials with a USDA soil texture of loamy very fine sand and finer. Hydric soil indicators within this group include loamy mucky mineral, loamy gleyed matrix, depleted matrix, redox dark surface, depleted dark surface, redox depressions, and vernal pools.

SWANCC WATERS

The term "isolated waters" is generally applied to waters/wetlands that are not connected by surface water to a river, lake, ocean, or other body of water. In the presence of isolated conditions, the Regional Board and CDFW take jurisdiction through the application of the OHWM/streambed and/or the 3 parameter wetland methodology utilized by the Corps.

Determination of Biologically Equivalent or Superior Preservation Report

Arroyo Vista Project

Permittee Name

County of Riverside
4080 Lemon Street
Riverside, California 92501

Consultant Name

ELMT Consulting, Inc.
2201 N. Grand Avenue #10098
Santa Ana, California 92711

January 2025

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APPENDIX

Appendix A Project Exhibits
Appendix B Site Plan
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1 EXECUTIVE SUMMARY

This report contains the results of the Determination of Biologically Equivalent or Superior Preservation (DBESP) analysis to demonstrate compliance with the requirements of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) for impacts to riparian/riverine resources. The proposed project would develop a Tentative Tract Map No. 38510 with 231 residential lots in unincorporated Riverside County, California

Two drainage features were observed within the project site. Drainage 1 transverses the site from the southeast to the northwest and converges with Drainage 2 near the northwest corner of the site. Drainage 2 is located on the northwest corner of the project site and flows from east to west. This drainage enters and exits the project site through the northern boundary and is directly supported by flows from Drainage 1 to the south.

Approximately 2.99 acres (5,598 linear feet) of riparian/riverine habitat were mapped within the proposed project site. The riparian/riverine habitat is synonymous with the jurisdiction of the California Department of Fish and Wildlife (CDFW) jurisdictional streambed. The proposed project design will result in permanent impacts of 0.24 acre to riparian/riverine habitat within Drainage 1 associated with road crossings. The project has been designed to avoid Drainage 1 to the maximum extent possible, with only two road crossings impacting Drainage 1 and a small erosional finger associated with Drainage 1. No impacts to Drainage 2 will occur.

Table 1: Summary of Riparian/Riverine Habitat

Drainage Name	**Riparian/Riverine Resources** Acres (linear feet)	**Impacts** Acres (linear feet)
Drainage 1	2.24 (4,795)	0.24 (408)
Drainage 2	0.75 (803)	0.0
Total	**2.99 (5,598)**	**0.24 (408)**

The applicant will mitigate impacts to 0.24 acre of riparian/riverine habitat through the management (removal of invasives) of approximately 2.75 acres of the riparian/riverine habitat onsite. Further, a conservation easement will be placed over the 2.75 acre area onsite, and a Habitat Mitigation Monitoring and Reporting Program will be prepared that will need to be approved by the County of Riverside Environmental Programs Division, Western Riverside County Regional Conservation Authority and regulatory agencies. The 2.75 acre of riverine/riparian habitat remaining onsite currently supports invasive plant species (i.e., Mexican fan palm, salt cedar, Arundo, and tree tobacco) that will be removed to enhance the riparian/riverine habitat onsite. This area will be managed by an approved third party.

The above actions would result in a net increase in the function and ecological value of riparian/riverine habitat within the region by preserving/enhancing high quality habitat within the existing drainage, and by

ensuring that approximately 92 percent of all riparian/riverine habitat onsite remain in its existing state in perpetuity through a conservation easement on future development over Drainage 1 and Drainage 2.

Focused surveys were conducted during the 2024 breeding season for least Bell's vireo. Five least Bell's vireo territories were observed onsite within Drainage 1 and 2 onsite, and one additional territory was observed within Drainage 2, just outside the project footprint. To reduce impacts to least Bell's vireo, approximately 92% of the onsite drainage features will be preserved and enhanced, and 6-foot solid masonry walls will be installed as far away from the edge of the riparian habitat as possible, separating the project from the riparian habitat which will act as a noise barrier. The masonry walls will be installed on an average of approximately 98-feet from the edge of riparian habitat which will separate the riparian habitats within Drainage 1 and Drainage 2 from the onsite development and act as a buffer. Double picket tubular steel fencing with gaps no greater than 2" will be installed along the backyards of lots 87 through 90 as to prevent cats from crossing the fence line (refer to Appendix D, *Riparian/Riverine Habitat Setbacks*). In addition to the proposed setbacks from the riparian riverine to the proposed walls or fences, there is an elevation difference between the drainage features and the pads, which range between 5 feet and 39 feet (refer to Appendix E, *Fence and Wall Plan*). With the 6-foot solid masonry wall, the elevation difference between the drainage feature would range from approximately 11 to 45 feet, creating a larger barrier from potential indirect impacts associated with noise and light on the riparian habitat.

In addition to each lot's perimeter wall/fence described above, the entire trail will be fenced by a 4-foot-high wood split rail fence with wire mesh covering the entire width and height of the fence to deter pedestrians, and dogs, from going into the riparian riverine habitat. The trail will also have posted signs at all trail entrances reflecting limited hours of use to the trail, signage to enforce dogs on leash at all times, as well as cautionary signage of rattlesnakes to deter residents from going into the riparian habitat as well as ensuring pedestrians keep their dogs on leashes. The project will not have any lighting on the trail. Any landscaping associated with the trail will have a restriction of non-native and invasive plant species and will not use any species listed in Table 6-2 of the MSHCP. To minimize the potential of temporal losses of least Bell's vireo, habitat enhancement and restoration activities will be phased to ensure that higher quality habitat will be available through restoration prior to impacting potentially occupied least Bell's vireo habitat.

The Project's Homeowner's Association (HOA) will be responsible for the maintenance of the trail, including fencing along the trail. Further, the development's HOA will educate the residents of the natural occurring wildlife and natural habitat as to better preserve and protect.

2 INTRODUCTION

2.1 Project Area

The site is generally located southeast of Interstate 91, west of Interstate 215 and east of Interstate 15 in unincorporated Riverside County, California. The project site is depicted on the Riverside East quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map within Section 24 of Township 3 South, Range 5 West. Specifically, the project site is located south of Gentian, west of Chicago Avenue, north of Iris Avenue, and east of Porter Avenue. within Assessor Parcel Numbers 245-300-001 and -004. Refer to Exhibits 1-3 in Appendix A.

2.2 Project Description

The project proposes to develop a Tentative Tract Map No. 38510 with 231 residential lots. The project will include offsite improvemtns to the frontage road and the rod on the northeast corrner of the site. No temporary impact areas are proposed.

2.3 Existing Conditions

Presently, the project site primarily supports inactive agricultural fields with some associated development and a series of arroyos that slope downwards from the southern and eastern boundaries towards the northwest corner. Undeveloped land supported on-site has been subject to a variety of anthropogenic disturbances associated with historic agricultural activities, associated development, discing activities, routine weed abatement, light vehicle and off-highway recreational vehicle access, and illicit dumping and camping. Historic aerials show that the site supported agricultural land uses since at least 1948. Prior to conducting the field investigation, aerial photography was reviewed to document existing site conditions and document the changes to the project site and surrounding area.

1948: The project site and surrounding areas support agricultural fields. The only portions of the site that do not support agricultural land uses occur along the steep arroyos that permeate the site. The site is bounded by agricultural fields to the west, south, and east, and open space to the north along downstream portions of the arroyos.

1948 – 1966: On-site and surrounding agricultural fields have been converted to citrus groves. Citrus groves now abut the top of the arroyo slopes. A relatively shallow arroyo extending north from the southern boundary has been filled and supports citrus groves. A residential development is present near the middle of the eastern portion of the site. Some residential parcels are present just beyond Iris Avenue at the southern boundary of the site. Former agricultural fields in the northwest portion of the site and off-site to the west are in various states of unuse.

1966 – 1967: Citrus groves have expanded further into the northwest portion of the site.

1967 – 1978: Agricultural fields are now present in the northwest corner of the site. The majority of adjacent land to the south has been converted into residential developments. New residential developments are present off-site to the southeast and northeast.

1978 – 1985: Agricultural land uses have been abandoned in the northwest corner of the site. Additional residential developments are present to the north.

1985 – 1994: Additional residential developments are present to the north and east. The abandoned agricultural field in the northwest corner of the site have been impacted by off-roading activities such that tracks are visible.

1994 – 2005: No changes.

2005 – 2009: Some grading and crop clearing has occurred in association with agricultural operations.

2010 – 2012: A small, paved loading area is present in the southeast portion of the site.

2012 – 2020: No changes occur outside of normal crop rotation activities.

2020 – 2021: Citrus groves have been removed.

2021 – 2023: No changes.

The disturbances outlined above have eliminated the natural plant communities that historically occurred on the less-topographically variable portions of the project site and surrounding area. Natural plant communities supported within the arroyo remain in a relatively natural state.

Vegetation

Three (3) plant communities are supported within the project site: southern willow scrub, Riversidean sage scrub, and non-native grassland. In addition, the project site supports two (2) land cover types that would be classified as disturbed and developed. Refer to Exhibit 4, *Vegetation*. The vegetation communities and land cover types are described in further detail below.

Southern Willow Scrub

The drainage feature that bisects the project site primarily supports a southern willow scrub plant community. This plant community is dominated by arroyo willow (*Salix lasiolepsis*) and black willow (*Salix goodingii*) and supports a variety of other trees and shrubs with an herbaceous understory. Other common species observed in the southern willow scrub plant community include Mexican fan palm (*Washingtonia robusta*), salt cedar (*Tamarix* sp.), giant creek nettle, mule fat, elderberry (*Sambucus mexicana* [*S. caerulea*]), bowlesia (*Bowlesia incana*), California bee plant (*Scrophularia californica*), common phacelia (*Phacelia distans*), Douglas' nightshade (*Solanum douglasii*), goldfields (*Lasthenia glabrata*), hairy leaved sunflower (*Helianthus annuus*), London rocket (*Sisymbrium irio*), needle goldfields

(*Lasthenia gracilis*), stinknet (*Oncosiphon pilulifer*), virgin's bower (*Clematis pauciflora*), barley (*Hordeum murinum*), and willow baccharis (*Baccharis salicina*).

The areas within the arroyo that support more routine surface flows are dominated by narrow-leaved cattail (*Typha augustifolia*), sparse watercress (*Sisymbrium nasturtium-aquaticum*), watercress (*Nasturtium officinale*), salt grass (*Distichlis spicata*), mule fat (*Baccharis salicifolia*), and giant creek nettle (*Urtica dioica* ssp. *holosericea*).

Riversidean Sage Scrub

The upper limits of the drainage feature that bisects the project site and some adjacent spaces support Riversidean sage scrub plant communities similar to historic vegetative cover that historically occupied the rolling hills of the site, prior to agricultural land uses. Due to the proximity of this plant community to the active flows and southern willow scrub supported within the arroyo, the Riversidean sage scrub supported on-site exhibits denser vegetation and higher diversity than would otherwise be found in the surrounding hills. This plant community is dominated by woody shrubs and trees such as elderberry, California sagebrush (*Artemisia californica*), black sage (*Salvia mellifera*), and mulefat, and supports a variety of low-growing shrubs and an herbaceous understory. Other common plant species observed in the Riversidean sage scrub supported by the project site include common phacelia, Douglas' nightshade, goldfields, London rocket, needle goldfields, stinknet, virgin's bower, barley, baby blue eyes (*Nemophila menziesii*), popcorn flower (*Plagiobothrys collinus*), chia sage (*Salvia columbariae*), fiddleneck (*Amsinckia* sp.), desert wishbone bush (*Mirabilis laevis*), foxtail chess (*Bromus madritensis*), miniature lupine (*Lupinus bicolor*), Pomona milk vetch (*Astragalus pomonensis*), strigose lotus (*Acmispon strigosus*), wild canterbury bells (*Phacelia minor*), wildoats (*Avena fatua*), and tarragon (*Artemisia dracunculus*).

Non-Native Grassland

The non-native grassland plant community is located on the northeast portion of the project site, in areas that have been subject to frequent anthropogenic disturbances but did not support historic agricultural land uses. This plant community is dominated by non-native grasses such as oat grasses (*Avena barbata* and A. *fatua*), brome grasses (*Bromus diandrus* and *B. madritensis*), and rattail fescue (*Festuca myuros*), with a limited presence of other early successional species such as Mediterranean schismus (*Schismus barbatus*), filarees (*Erodium brachycarpum* and *E. cicutarum*), mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), annual beard grass (Polypogon monspeliensis), and Jersey cudweed (*Pseudognaphalium luteoalbum*).

Disturbed

Disturbed land is supported through most portions of the project site that occur away from the arroyo, where historic agricultural land uses eliminated the natural plant communities that once occurred. The disturbed areas of the project site support many of the aforementioned species found in the non-native grassland plant community. Disturbance type varies throughout the site, with grading and weed abatement occurring throughout all areas, piling of refuse materials occurring near the center of most parcels, and illegal dumping being prominent around the site boundaries.

Additionally, the northern boundary of the site supports an unnamed man-made drainage and is bounded to the north by residential development. This feature primarily supports non-native weedy/early successional species, but also supports ornamental vegetation, and species adapted to more mesic conditions. Common plant species observed along the northern boundary include those observed in the non-native grassland in addition to oleander (*Nerium oleander*), red gum eucalyptus (*Eucalyptus camaldulensis*), vinegar weed (*Trichostema lanceolatum*), morning glory (*Calystegia macrostegia*), curly dock (*Rumex crispus*), speedwell (*Veronica* sp.), and common sunflower (*Helianthus annuus*).

Developed

Developed areas generally encompass all buildings/structures or any paved or otherwise impervious surfaces. Developed land is present in the northern and southwest portions of the project site, in the middle portion of the site where remnant roads have not deteriorated, and areas associated with the house onsite. Vegetative cover in these areas is generally barren but may include sparse coverage of weedy, invasive, and/or primary-successional species, or remnant ornamental species.

Jurisdictional Resources

Drainage 1

Drainage 1 is the longest drainage feature on the project site. It flows from southeast to northwest as it bisects the project site and converges with Drainage 2 near the northwest corner of the site, and supports a sparse southern willow scrub plant community. The drainage enters the site from an earthen channel at the southeastern corner of the project site and flows ephemeral. The onsite drainage features receive flows via direct precipitation, and from the discharge urban runoff from residential developments upstream. Drainage 1 is approximately 4,795 linear feet with an average OHWM that ranges from 2 to 13 feet wide.

The drainage feature that bisects the project site primarily supports a southern willow scrub plant community. This plant community is dominated by arroyo willow (*Salix lasiolepsis*) and black willow (*Salix goodingii*) and supports a variety of other trees and shrubs with an herbaceous understory. Other common species observed in the southern willow scrub plant community include Mexican fan palm (*Washingtonia robusta*), salt cedar (*Tamarix* sp.), giant creek nettle, mule fat, elderberry (*Sambucus mexicana* [*S. caerulea*]), bowlesia (*Bowlesia incana*), California bee plant (*Scrophularia californica*), common phacelia (*Phacelia distans*), Douglas' nightshade (*Solanum douglasii*), goldfields (*Lasthenia glabrata*), hairy leaved sunflower (*Helianthus annuus*), London rocket (*Sisymbrium irio*), needle goldfields (*Lasthenia gracilis*), stinknet (*Oncosiphon pilulifer*), virgin's bower (*Clematis pauciflora*), barley (*Hordeum murinum*), and willow baccharis (*Baccharis salicina*).

There are two smaller drainages that are part of Drainage 1 on the northwest portion of the site. These two features are small features that follow on-site topography and connect into Drainage 1. They are ephemeral features with no hydrophytic vegetation or soils.

Drainage 2

Drainage 2 is located on the northwest corner of the project site and flows in an east-west direction. The segment of the drainage that occurs within the project site is approximately 803 linear feet with an average

OHWM that ranges from 12 to 18 feet wide. Flows originate east of the project site and convey natural runoff, agricultural runoff, and nuisance flows from the surrounding residential developments. Water flows through the drainage quickly and there is evidence of scouring during large storm events. Although the drainage supports a stand of southern willow scrub, there is little to no vegetation with the active channel (within the OHWM). The feature is an earthen channel with clearly defined bed and banks that conveys flows all year round. The unnamed drainage feature supports a southern willow scrub vegetation community characterized by arroyo willow (*Salix lasiolepis*; FACW) and mule fat (*Baccharis salicifolia*; FAC).

3 RIPARIAN/RIVERINE MITIGATION (SECTION 6.1.2)

3.1 Methods

Section 6.1.2 of the MSHCP, identifies Riparian/Riverine resources as lands which contain habitat dominated by trees, shrubs, persistent emergent vegetation, or emergent mosses and lichens, which occur close to or which depend upon soil moisture from nearby fresh water sources, or areas with freshwater flow during all or a portion of the year. Riverine habitat includes all wetlands and deep-water habitats contained in natural or artificial channels periodically or continuously containing flowing water or which forms a connecting link between the two bodies of standing water. Riverine habitat is bounded on the landward side by upland, by the channel bank (including natural and man-made levees), or by wetlands dominated by trees, shrubs, persistent emergents, mosses, or lichens. In braided streams, the system is bounded by the banks forming the outer limits of the depression within which the braiding occurs. Springs discharging into a channel are considered part of the riverine habitat. The term riparian is used to define the type of wildlife habitat found along the banks of a river, stream, lake or other body of water. Riparian habitats are ecologically diverse and can be found in many types of environments including grasslands, wetlands and forests.

Based on the results of a Delineation of State and Federal Jurisdictional Waters Report (ELMT, 2023) prepared under a separate cover, two (2) unnamed drainage features were observed on the project site. These features will be considered riparian/riverine habitat under Section 6.1.2 of the MSHCP. The extent of the riparian/riverine habitat on the project site is synonymous with the jurisdiction of CDFW. The majority of the project has been designed to avoid riparian areas associated with Drainage 1 and Drainage 2 in their existing condition. However, approximately 0.24 acre of southern willow scrub habitat will be impacted from project implementation.

The majority of the project site does not support riparian habitats; however, Drainage 1 and 2, support a southern willow scrub plant community that provides moderate quality habitat for the State- and federally-listed as endangered least Bell's Vireo (*Vireo bellii pusillus* [LBVI]), and is not expected to provide suitable habitat for the other riparian obligate species listed under the MSHCP that may occur within the regional vicinity, including southwestern willow flycatcher (*Empidonax traillii extimus*), or yellow-billed cuckoo (*Coccyzus americanus*).

The composition of the southern willow scrub plant community riparian scrub supported on-site has been degraded by invasive plant species and previous agricultural activities. The mixed riparian scrub, located outside of the proposed limits of disturbance does not have a contiguous willow canopy, and does not provide the dense, multi-storied canopy for southwestern willow flycatcher and yellow-billed cuckoo. Due to incomplete canopy, limited acreage, and lack of riparian plant species diversity of the mixed riparian scrub supported on-site, the habitat associated with the on-site drainage feature was determined not to provide suitable habitat for southwestern willow flycatcher and yellow-billed cuckoo. However, the southern willow scrub plant community has the potential to provide moderate quality habitat for LBVI. LBVI do not require the dense multi-storied riparian canopy that southwestern willow flycatcher and yellow-billed cuckoo need.

Focused surveys were conducted during the 2024 survey season for LBVI and southwestern willow flycatcher. No Southwestern willow flycatcher were observed onsite during the 2024 surveys. However, LBVI territories were observed during the 2024 season.

Based on results of the habitat assessment for Section 6.1.2 riparian bird species, focused surveys for the least Bell's vireo were conducted during the spring of 2024. A total of eight (8) protocol least Bell's vireo surveys were conducted within the riparian corridor that bisects the property as illustrated in Exhibit 4. All surveys followed the recommended USFWS guidelines. Specifically, guidelines for least Bell's vireo surveys require that at least eight (8) surveys be conducted from April 10th to July 31st, and guidelines for southwestern willow flycatcher require five (5) surveys from May 15 and May 31, with the second and third between June 1 and June 21, and the fourth and fifth between June 22 and July 17.

The riparian habitats were systematically surveyed on May 11, 21, 31, June 10, 21, and July 3 and 11, 2024, by walking slowly and methodically along their margins. All observations of least Bell's vireo, including their behavior and breeding status were recorded and their locations noted. All surveys were conducted under optimal weather conditions and during early morning hours when bird activity is at a peak.

Vernal Pools

One of the factors for determining the suitability of the habitat for fairy shrimp would be demonstrable evidence of seasonal ponding in an area of topographic depression that is not subject to flowing waters. These astatic pools are typically characterized as vernal pools. More specifically, vernal pools are seasonal wetlands that occur in depression areas without a continual source of water. They have wetland indicators of all 3 parameters (soils, vegetation, and hydrology) during the wetter portion of the growing season but normally lack wetland indicators of hydrology and/or vegetation during the drier portion of the growing season. Obligate hydrophytes and facultative wetlands plant species are normally dominant during the wetter portion of the growing season. The determination that an area exhibits vernal pool characteristics and the definition of the watershed supporting vernal pool hydrology is made on a case-by-case basis. Such determinations should be considered the length of time the areas exhibit upland and wetland characteristics and the manner in which the area fits into the overall ecological system as a wetland. The seasonal hydrology of vernal pools provides for a unique environment, which supports plants and invertebrates specifically adapted to a regime of winter inundation, followed by an extended period when the pool soils are dry.

Vernal pools are seasonally inundated, ponded areas that only form in regions where specialized soil and climatic conditions exist. During fall and winter rains typical of Mediterranean climates, water collects in shallow depressions where downward percolation of water is prevented by the presence of a hard pan or clay pan layer (duripan) below the soil surface. Later in the spring when rains decrease and the weather warms, the water evaporates, and the pools generally disappear by May. The shallow depressions remain relatively dry until late fall and early winter with the advent of greater precipitation and cooler temperatures. Vernal pools provide unusual "flood and drought" habitat conditions to which certain plant and wildlife species have specifically adapted as well as invertebrate species such as fairy shrimp.

The MSHCP lists two general classes of soils known to be associated with listed and special-status plant species: clay soils and Traver-Domino Willow association soils. The specific clay soils known to be associated with listed and special-status species within the MSHCP plan area include Bosanko, Auld, Altamont, and Porterville series soils, whereas Traver-Domino Willows association includes saline-alkali soils largely located along floodplain areas of the San Jacinto River and Salt Creek. Without the appropriate soils to create the impermeable restrictive layer, none of the special-status plant or wildlife species associated with vernal pools can occur on the project site. None of these soils have been documented within the project site.

A review of recent and historic aerial photographs (1948-2023) of the project site during wet and dry seasons did not provide visual evidence of an astatic or vernal pool conditions within the project site. The site supported historic agricultural activities which heavily compacted the soils on-site. No ponding was observed during the field investigation, further supporting the fact that the drainage patterns currently occurring on the project site do not follow hydrologic regime needed for vernal pools. From this review of historic aerial photographs and observations during the field investigations, it can be concluded that there is no indication of vernal pools or suitable fairy shrimp habitat occurring within the proposed project site.

Based on the historical aerial review, existing human disturbances, and current hydrologic regimes of the project site, it can be concluded that the project site lacks astatic conditions, and, therefore, would not provide suitable fairy shrimp habitat. Fairy shrimp require astatic conditions and a complete drying of occupied ponds so that the fairy shrimp cysts will not rot. As a result, none of the sensitive plant or wildlife species associated with vernal pools are expected to occur on the project site. Sensitive plant and wildlife species associated with vernal pools and clay soils, including fairy shrimp, are presumed absent from the project site.

3.2 Results/Impacts

The on-site drainage collectively performs the following functions within the local area of the watershed: regulation of nuisance flows, energy dissipation, nutrient cycling, retention of particulates, nutrient/particulate uptake from off-site, upstream development, and connectivity with similar habitat upstream. Drainages 1 and 2, within the project footprint, will be considered riparian/riverine habitat under the MSHCP.

The proposed project will result in permanent impacts to approximately 0.24-acre of riparian/riverine habitat within Drainage 1.

Table 2: Impacts to Riparian/Riverine Habitat

Jurisdictional Feature	Riparian/Riverine Habitat	
	On-Site Jurisdiction Acreage (Linear Feet)	Jurisdictional Impacts Acreage (Linear Feet)
Drainage 1	2.24 (4,795)	0.24
Drainage 2	0.75 (803)	0
TOTAL	**2.99 (5,598)**	**0.24**

3.3 Mitigation and Equivalency

3.3.1 Direct Effects

The applicant will mitigate impacts to 0.24 acre of riparian/riverine habitat through the management (removal of invasives) of approximately 2.75 acres of the riparian/riverine habitat onsite. Further, a conservation easement will be placed over the 2.75 acre area onsite, and a Habitat Mitigation Monitoring and Reporting Program will be prepared that will need to be approved by the County of Riverside Environmental Programs Division, Western Riverside County Regional Conservation Authority and regulatory agencies. The 2.75 acre of riverine/riparian habitat currently supports invasive plant species (i.e., Mexican fan palm, salt cedar, and tree tobacco) that will be removed to enhance the riparian/riverine habitat onsite. The applicant will replant the impacted areas with native landscaping.

The above actions would result in a net increase in the function and ecological value of riparian/riverine habitat within the region by preserving/enhancing high quality habitat within the existing drainage, and by ensuring that approximately 92 percent of all riparian/riverine habitat onsite remain in its existing state in perpetuity through a conservation easement on future development over Drainage 1 and Drainage 2.

In effort to mitigate and ensure suitable habitat for Least Bell's Viero, the applicant will preserve and enhance approximately 92% of the onsite drainage features. Six-foot solid concrete masonry walls will be installed as far away from the edge of the riparian habitat as possible, separating the project from the riparian habitat which will act as a barrier for noise and light. The masonry walls will be installed on an average of approximately 98-feet from the edge of riparian habitat which will separate the riparian habitats within Drainage 1 and Drainage 2 from the onsite development and act as a buffer. Double picket tubular steel fencing with gaps no greater than 2" will be installed along the backyards of lots 87 through 90 as to prevent cats from crossing the fence line. In addition to the proposed setbacks from the riparian riverine to the proposed walls or fences, there is an elevation difference between the drainage features and the pads, which range between 5 feet and 39 feet. With the 6-foot solid masonry wall, the elevation difference between the drainage feature would range from approximately 11 to 45 feet, creating a larger barrier from potential indirect impacts associated with noise and light on the riparian habitat. The quality and amount of suitable habitat for Least Bell's Vireo decreases at the southeast end of the drainage feature, thus decreasing the need for larger buffers.

In addition to each lot's perimeter wall/fence described above, the entire trail will be fenced by a 4-foot-high wood split rail fence with wire mesh covering the entire width and height of the fence to deter pedestrians, and dogs, from going into the riparian riverine habitat. The trail will also have posted signs at all trail entrances reflecting limited hours of use to the trail, signage to enforce dogs on leash at all times, as well as cautionary signage of rattlesnakes to deter residents from going into the riparian habitat as well as ensuring pedestrians keep their dogs on leashes. The project will not have any lighting on the trail. Any landscaping associated with the trail will have a restriction of non-native and invasive plant species and will not use any species listed in Table 6-2 of the MSHCP. To minimize the potential of temporal losses of least Bell's vireo, habitat enhancement and restoration activities will be phased to ensure that higher quality

habitat will be available through restoration prior to impacting potentially occupied least Bell's vireo habitat.

The Project's Homeowner's Association (HOA) will be responsible for the maintenance of the trail, including fencing along the trail. Further, the development's HOA will educate the residents of the natural occurring wildlife and natural habitat as to better preserve and protect.

Least Bell's Vireo

A total of 0.24-acre of permanent impacts to suitable and occupied least Bell's vireo habitat (southern willow scrub) will occur within Drainage 1. As outlined below, the MSHCP identifies four (4) objectives (presented as *italics/underlined*) for the protection of least Bell's vireo habitat, followed by an analysis of MSHCP project consistency.

1) "*Include within the MSHCP Conservation Area at least 9,430 acres of suitable habitat*" (MSHCP 2004). Permanent impacts to 0.24-acre of riparian habitat occupied or representing suitable habitat for the least Bell's vireo within Drainage 1 will be subject to additional mitigation through enhancement and protection of the remaining onsite riparian habitat. The preservation and enhancement of approximately 2.75 acre of onsite riparian/riverine habitat will provide suitable habitat to the MSHPC conservation area, that would not have normally been conserved in perpetuity for least Bell's vireo.

2) "*Include within the MSHCP Conservation Area at least 8 core areas and interconnecting linkages*" (MSHCP 2004). Permanent impacts to 0.24-acre of riparian habitat occupied or representing suitable habitat for the least Bell's vireo within Drainage 1. The project site is not located within any of the 8 identified core areas or interconnecting linkages.

3) "*Include within the MSHCP Conservation Area additional areas within the Criteria Area identified as important to the least Bell's vireo. If survey results are positive, 90% of the occupied portions of the property that provide for long-term conservation value shall be conserved. This will involve including 100 meters of undeveloped landscape adjacent to the habitat conserved*" (MSHCP 2004). As previously noted, the project site is not located within any of the 8 identified core areas, interconnecting linkages, or MSHCP designated Criteria Cells. In order to reduce impacts to least Bell's vireo, approximately 92% of the onsite drainage features will be preserved and enhanced and 6 foot solid masonry walls will be installed as far away from the edge of the riparian habitat as possible. The masonry walls will be installed approximately 20 feet from the edge of riparian habitat which will separate the riparian habitats within Drainage 1 and Drainage 2 from the onsite development. Additionally, the elevation difference between the drainage features and the pads ranges between 5 feet and 39 feet. With the 6-foot solid masonry wall, the elevation difference between the drainage feature would range from approximately 11 to 45 feet, a larger barrier from potential indirect impacts associated with noise and light on the riparian habitat.
   In addition to each lot's perimeter wall/fence described above, the entire trail will be fenced by a 4-foot-high wood split rail fence with wire mesh covering the entire width and height of the fence

to deter pedestrians, and dogs, from going into the riparian riverine habitat. The trail will also have posted signs at all trail entrances reflecting limited hours of use to the trail, signage to enforce dogs on leash at all times, as well as cautionary signage of rattlesnakes to deter residents from going into the riparian habitat as well as ensuring pedestrians keep their dogs on leashes. The project will not have any lighting on the trail. Any landscaping associated with the trail will have a restriction of non-native and invasive plant species and will not use any species listed in Table 6-2 of the MSHCP. To minimize the potential of temporal losses of least Bell's vireo, habitat enhancement and restoration activities will be phased to ensure that higher quality habitat will be available through restoration prior to impacting potentially occupied least Bell's vireo habitat.

The Project's Homeowner's Association (HOA) will be responsible for the maintenance of the trail, including fencing along the trail. Further, the development's HOA will educate the residents of the natural occurring wildlife and natural habitat as to better preserve and protect.

4) "*Within the MSHCP Conservation Area, maintain (once every 3 years) the continued use of, and successful reproduction at 75% percent of known vireo occupied habitat (including any nesting locations identified in the MSHCP Conservation Area in the future)*" (MSHCP 2004). Based on recent as well as historic observations of least Bell's vireo within Riverside County, the species is expected to continue to breed within Drainage 1 and 2 onsite following project implementation.

In addition to implementing all four (4) least Bell's vireo objectives listed above, initial vegetation clearing of occupied or potential least Bell's vireo habitat will occur outside of the nesting season (March 15th to September 15th). Potential indirect impacts to suitable least Bell's vireo habitat within Drainage 1 and Drainage 2 during and following completion of construction and riparian reestablishment will be avoided by implementing all MSHCP Best Management Practices (BMP) including a commitment to conduct noise monitoring during construction activities in order to ensure noise levels do not exceed 60dB within 300 feet of least Bell's vireo habitat during the nesting period.

3.3.2 Indirect Effects

The following minimization measures have been incorporated into the project design to ensure that all indirect project-related impacts to riparian/riverine habitat, including impacts from fugitive dust, toxics, invasive plant species, and grading/land development, are avoided or minimized to the greatest extent feasible.

Fugitive Dust

During soil excavation, grading, or other subsurface disturbance within 100 feet of conserved riparian/riverine habitat onsite, the construction superintendent shall supervise provision and maintenance of all standard dust control best management practices (BMPs) to reduce fugitive dust emissions, including but not limited to the following actions:

- Water any exposed soil areas a minimum of twice per day, or as allowed under any imposed drought restrictions. On windy days or when fugitive dust can be observed leaving the construction site, additional water shall be applied at a frequency to be determined by the on-site construction superintendent.
- Pave, periodically water, or apply chemical stabilizer to construction access/egress points.
- Minimize the amount of area disturbed by clearing, grading, earthmoving, or excavation operations at all times.
- Operate all vehicles on graded areas at speeds less than 15 miles per hour.
- Cover all stockpiles that will not be utilized within three days with plastic or equivalent material, to be determined by the on-site construction superintendent, or spray them with a non-toxic chemical stabilizer.

Runoff - Toxics

To address potential short-term impacts to water quality from construction runoff that may carry storm water pollutants downstream, a Storm Water Pollution Prevention Program (SWPPP) shall be implemented by the construction contractor as required by the California General Construction Storm Water Permit pursuant to State Water Quality Control Board and Regional Board regulations. The SWPPP shall identify BMPs related to the control of toxic substances, including construction fuels, oils, and other liquids. These BMPs will be implemented by the Applicant's contractor prior to the start of any ground clearing activity, shall be subject to periodic inspections by the City and the project's hydrological consultant, and shall be maintained throughout the construction period and remain in place until all landscape and permanent BMPs are in place. BMPs shall be monitored and repaired if necessary to ensure maximum erosion, sediment, and pollution control.

- Permittee shall prohibit the use of erosion control materials potentially harmful to fish and wildlife species, such as mono-filament netting (erosion control matting) or similar material, within and adjacent to CDFW jurisdictional areas.
- All fiber roles [1], straw waddles, and/or hay bales utilized within and adjacent to the project site shall be free of non-native plant materials.
- Permittee shall comply with all litter and pollution laws. All contractors, subcontractors, and employees shall also obey these laws and it shall be the responsibility of Permittee to ensure compliance.
- Permittee shall not allow water containing mud, silt, or other pollutants from grading, aggregate washing, or other activities to enter a lake, streambed, or flowing stream or be placed in locations that may be subjected to high storm flows.

[1] Fiber rolls or erosion control mesh shall be made of loose-weave mesh that is not fused at the intersections of the weave, such as jute, or coconut (coir) fiber, or other products without welded weaves. Non-welded weaves reduce entanglement risks to wildlife by allowing animals to push through the weave, which expands when spread.

- Spoil sites shall not be located within a lake, streambed, or flowing stream or locations that may be subjected to high storm flows, where spoil shall be washed back into a lake, streambed, or flowing stream where it will impact streambed habitat and aquatic or riparian vegetation.
- Raw cement/concrete or washings thereof, asphalt, paint, or other coating material, oil or other petroleum products, or any other substances which could be hazardous to fish and wildlife resources resulting from project related activities shall be prevented from contaminating the soil and/or entering the waters of the State. These materials, placed within or where they may enter a lake, streambed, or flowing stream by Permittee or any party working under contract or with the permission of Permittee, shall be removed immediately.
- No equipment maintenance shall be done within or near any lake, streambed, or flowing stream where petroleum products or other pollutants from the equipment may enter these areas under any flow.
- No broken concrete, cement, debris, soil, silt, sand, bark, slash, sawdust, rubbish, or washings thereof, oil or petroleum products, or other organic or earthen material from any construction or associated activity of whatever nature shall be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the State. When operations are completed, any excess materials or debris shall be removed from the work area. No rubbish shall be deposited within 150 feet of the edge of any lake, streambed, or flowing stream.

Accidental Encroachments During Construction

The following measures shall also be incorporated into the construction documents and specifications, and implemented by the contractor, to avoid potential construction-related impacts to conserved riparian/riverine habitat outside of the approved disturbance limits:

- Construction worker training shall be provided by a qualified biologist at the first pre-construction meeting;
- Exclusionary fencing and signs shall be erected near the top of slope adjacent to conserved riparian/riverine habitat to prevent accidental/unauthorized intrusions during construction;
- No equipment shall be operated in areas of flowing water;
- Construction access and staging areas for storage of materials and heavy equipment, and for fueling, cleaning, or maintenance of construction vehicles or equipment, shall be prohibited within 20 feet from the top of slope adjacent to conserved riparian/riverine habitat; and
- A qualified biologist shall be onsite during initial clearing/grubbing, grading, and/or construction activities within the riparian/riverine habitat that will be impacted within the onsite drainage features, or within 100 feet of the habitat to be avoided and shall periodically monitor these activities to ensure they do not exceed the fenced construction limits.

Post-Construction Human Disturbances

The project shall incorporate special edge treatments designed to minimize edge effects by providing a safe transition between developed areas and conserved riparian/riverine habitat, and which would be compatible with project operation and the protection and sustainability of conserved areas. Special edge treatments shall include native landscaping on manufactured slopes within the conserved areas and fencing/signage

near the top of slope adjacent to conserved areas to prevent unauthorized public access, vandalism, illegal dumping, and other adverse human disturbances. The 6-foot masonry walls, and grade separation will act as a buffer following development, reducing noise and lighting impacts within the onsite drainage features.

In addition to each lot's perimeter wall/fence described above, the entire trail will be fenced by a 4-foot-high wood split rail fence with wire mesh covering the entire width and height of the fence to deter pedestrians, and dogs, from going into the riparian riverine habitat. The trail will also have posted signs at all trail entrances reflecting limited hours of use to the trail, signage to enforce dogs on leash at all times, as well as cautionary signage of rattlesnakes to deter residents from going into the riparian habitat as well as ensuring pedestrians keep their dogs on leashes. The project will not have any lighting on the trail. Any landscaping associated with the trail will have a restriction of non-native and invasive plant species and will not use any species listed in Table 6-2 of the MSHCP. To minimize the potential of temporal losses of least Bell's vireo, habitat enhancement and restoration activities will be phased to ensure that higher quality habitat will be available through restoration prior to impacting potentially occupied least Bell's vireo habitat.

The Project's Homeowner's Association (HOA) will be responsible for the maintenance of the trail, including fencing along the trail. Further, the development's HOA will educate the residents of the natural occurring wildlife and natural habitat as to better preserve and protect.

4 ADDITIONAL SURVEY NEEDS (SECTION 6.3.2)

4.1 Burrowing Owl

Burrowing owl is currently designated as a California Species of Special Concern. The burrowing owl is a grassland specialist distributed throughout western North America where it occupies open areas with short vegetation and bare ground within shrub, desert, and grassland environments. Burrowing owls use a wide variety of arid and semi-arid environments with level to gently sloping areas characterized by open vegetation and bare ground. The western burrowing owl (*A.c. hypugaea*), which occurs throughout the western United States including California, rarely digs its own burrows and is instead dependent upon the presence of burrowing mammals (i.e., California ground squirrels, coyotes, and badgers) whose burrows are often used for roosting and nesting. The presence or absence of colonial mammal burrows is often a major factor that limits the presence or absence of burrowing owls. Where mammal burrows are scarce, burrowing owls have been found occupying man-made cavities, such as buried and non-functioning drain pipes, stand-pipes, and dry culverts. They also require low growth or open vegetation allowing line-of-sight observation of the surrounding habitat to forage and watch for predators. In California, the burrowing owl breeding season extends from the beginning of February through the end of August.

4.1.1 Methods

Under the MSHCP burrowing owl is considered an adequately conserved covered species that may still require focused surveys in certain areas as designated in Figure 6-4 of the MSHCP. The project site occurs within the MSHCP burrowing owl survey area and a habitat assessment was conducted for the species to ensure compliance with MSHCP guidelines for the species. In accordance with the MSHCP Burrowing Owl Survey Instructions (2006), survey protocol consists of two steps, Step I – Habitat Assessment and Step II – Locating Burrows and Burrowing Owls. The following section describes the methodology followed during the burrowing owl habitat assessment conducted for this project.

- Step I – Habitat Assessment: Step 1 of the MSHCP habitat assessment for burrowing owl consists of a walking survey to determine if suitable habitat is present on-site. Two habitat assessments were conducted on November 1, 2021, and February 9, 2023. Upon arrival at the project site, and prior to initiating the assessment survey, binoculars were used to scan all suitable habitats on and adjacent to the property, including perch locations, to establish owl presence.

  All suitable areas of the project site were surveyed on foot by walking slowly and methodically while recording/mapping areas that may represent suitable owl habitat on-site. Primary indicators of suitable burrowing owl habitat in western Riverside County include, but are not limited to, native and non-native grassland, interstitial grassland within shrub lands, shrub lands with low density shrub cover, golf courses, drainage ditches, earthen berms, unpaved airfields, pastureland, dairies, fallow fields, and agricultural use areas. Burrowing owls typically use burrows made by fossorial mammals, but they often utilize man-made structures, such as earthen berms, cement culverts, cement, asphalt, rock, wood debris piles, openings beneath cement or asphalt pavement. Burrowing owls are often found within, under, or in close proximity to man-made structures.

According to the MSHCP guidelines, if suitable habitat is present, the biologist should also walk the perimeter of the property, which consists of a 150-meter (approximately 500 feet) buffer zone around the project site boundary. If permission to access the buffer area cannot be obtained, the biologist shall not trespass, but visually inspect adjacent habitats with binoculars. In addition to surveying the entire Project Site all bordering natural habitats located immediately adjacent to the Project Site were assessed. Results from the habitat assessment indicate that suitable resources for burrowing owl are present throughout the Project Site. Accordingly, if suitable habitat is documented on-site or within adjacent habitats, both Step II, focused surveys and the 30-day pre-construction surveys are required in order to comply with the MSHCP guidelines.

- Step II – Locating Burrows and Burrowing Owls: Concurrent with the initial habitat assessments, a detailed focused burrow survey was conducted and included documentation of appropriately sized natural burrows or suitable man-made structures that may be utilized by burrowing owl - as part of the MSHCP protocol, which is described below under Part A, Focused Burrow Survey. The MSHCP protocol indicates that no more than 100 acres should be surveyed per day/per biologist.

    - Part A – Focused Burrow Survey: A systematic survey for burrows, including burrowing owl sign, was conducted by walking across all suitable habitats mapped within the project site on November 1, 2021, and February 9, 2023. Pedestrian survey transects were spaced to allow 100% visual coverage of the ground surface. The distances between transect centerlines were no more than 30 meters (approximately 100 feet) apart, and owing to the terrain, often much smaller. Transect routes were also adjusted to account for topography and in general ground surface visibility. Areas providing potential habitat for burrowing owls were surveyed for suitable burrows, consisting of natural and non-natural substrates in areas with low, open vegetation. All burrows encountered were examined for shape, scat, pellets, white-wash, feathers, tracks, and prey remains. Suitable burrows/sites, including rock piles and non-natural substrates, were thoroughly examined for signs of presence.

    - Part B – Focused Surveys: Due to surrounding development to the south, east, and northeast, a zone of influence was not able to be surveyed; however, these areas do not support suitable habitat for burrowing owls. Some areas to the north and west of the project site within 500 feet, support dense vegetation and were determined not to provide suitable habitat. Survey transects on the project site were oriented north to west and were conducted at a maximum of 30-meter (approximately 100 feet) intervals to ensure 100% visual coverage of all areas in suitable habitat on the project site, and within the survey area. The focused burrowing owl surveys were conducted during the recognized timeframe (the breeding season is typically March through August) in the morning one hour before sunrise to two hours after sunrise.

      Suitable burrows/sites, including rock piles and non-natural substrates, were thoroughly examined for signs of presence. All burrows encountered were examined for shape, scat, pellets, white-wash, feathers, tracks, and prey remains. The location of all suitable

burrowing owl habitat, potential owl burrows, burrowing owl sign, and any owls observed were recorded and mapped, with a hand-held GPS unit, if observed. Methods to detect presence of burrowing owls included direct observation, aural detection, and signs of presence. Binoculars were used to observe distant birds and their activity around potential nesting habitat. During the focused surveys, the survey area was assessed on foot by qualified biologists Jacob H. Lloyd Davies, Rachael A. Lyons, and Megan E. Peukert, who are knowledgeable in the habitats and behavior of burrowing owls.

4.1.2 Results/Impacts

Four focused burrowing owl surveys were conducted on April 22, May 6 and 28, and June 18, 2024. All surveys were completed between 0630 and 1030. The surveys were conducted to document the presence/absence of burrowing owl on the project site. Refer to Table 3, *Survey Data*, for a summary of the survey dates and times, personnel, weather conditions, and general findings.

Table 3: Burrowing Owl Survey Data

Survey No.	Survey Date	Surveyor	Time	Temperature (˚F)	Cloud Cover	Wind Speed (mph)	Burrowing Owl Detected On-Site
1	4/22/24	Jacob H. Lloyd Davies, Rachael A. Lyons, Megan E. Peukert	0700-1030	56-67	0%	2-5	No
2	5/6/24	Rachael A. Lyons & Megan E. Peukert	0700-1015	57-63	30%	3-8	No
3	5/28/24	Rachael A. Lyons & Megan E. Peukert	0700-1030	56-67	30%	2-10	No
4	6/18/24	Rachael A. Lyons & Megan E. Peukert	0630-1030	61-73	30%	2-10	No

Based on the results of the 2024 burrowing owl focused surveys, no burrowing owls or evidence of recent or historic use by burrowing owls were observed on the project site. As a result, burrowing owls are presumed to be absent from the project site.

4.1.3 Mitigation and Equivalency

4.1.3.1 Direct Effects

To ensure burrowing owl remain absent from the project site, it is recommended that a 30-day burrowing owl pre-construction clearance survey be conducted in accordance with the *Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area* prior to any ground disturbing activities. If burrowing owls and/or birds displaying nesting behaviors are observed within the project site during future construction, further review may be needed to ensure compliance with the MSHCP, MBTA and Fish and Game Code.

4.1.3.2 Indirect Effects

If no burrowing owls are found onsite during the pre-construction clearance survey, no indirect effects to burrowing owl are expected to occur.

5 REFERENCES

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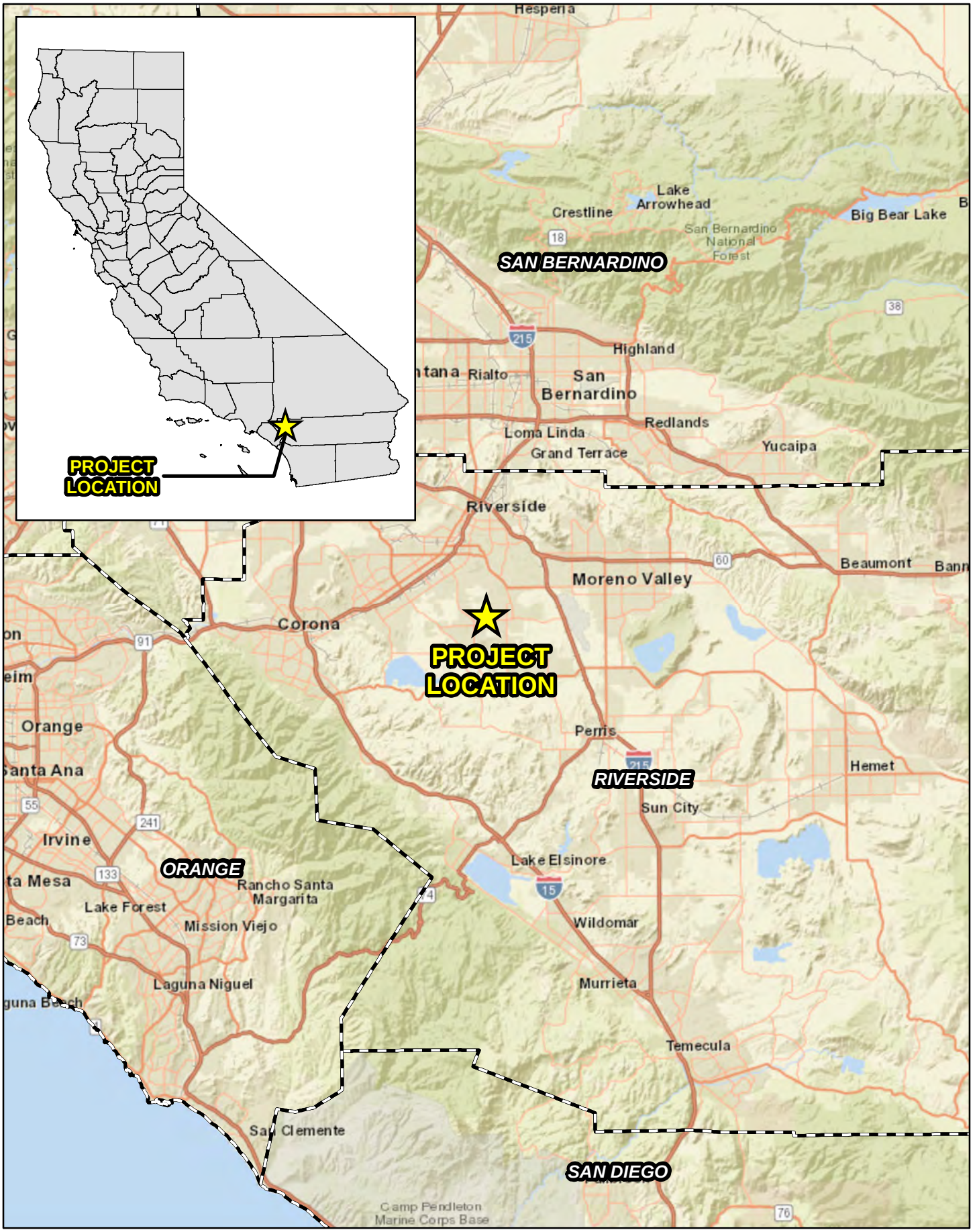
Appendix A Project Exhibits

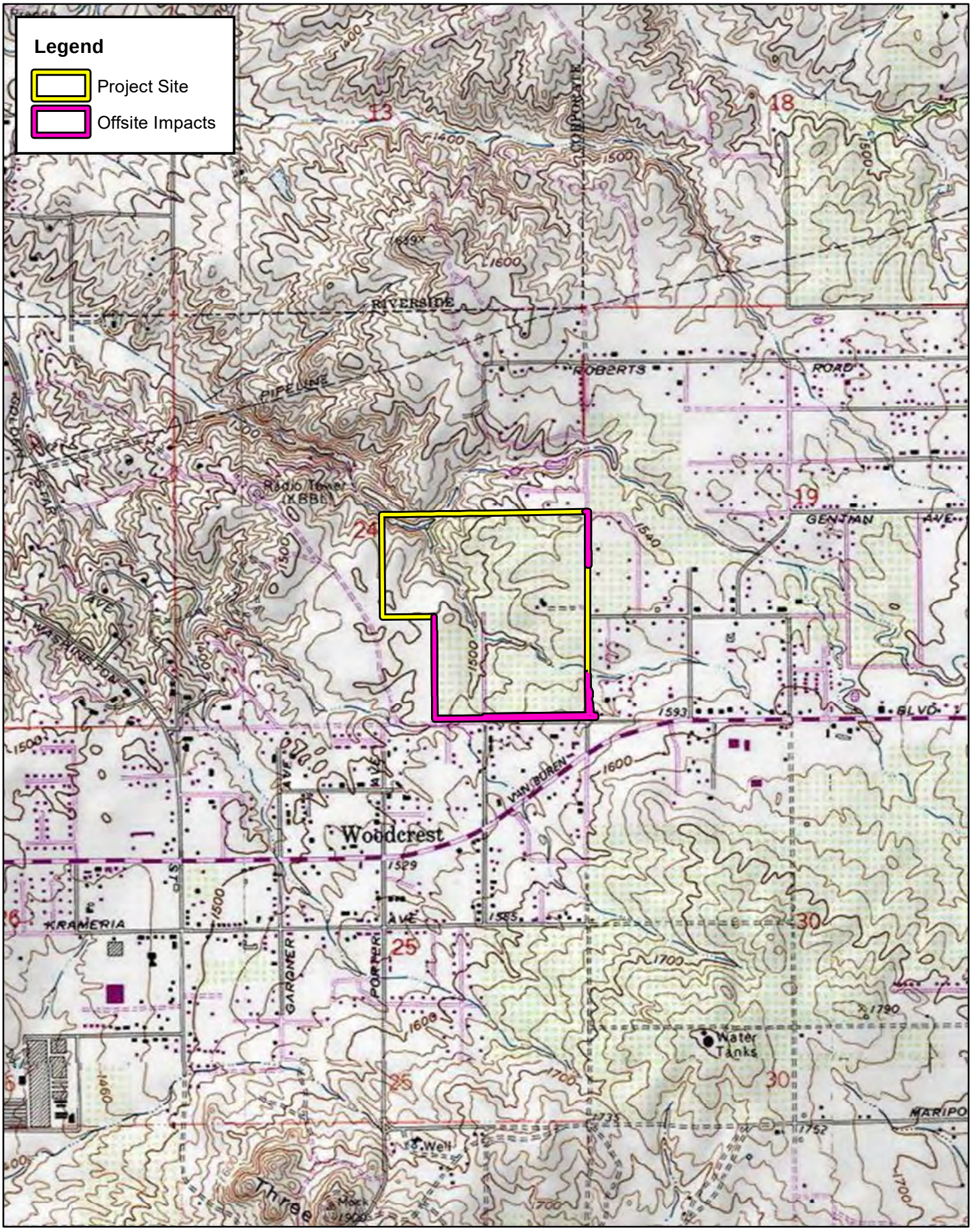


ELMT CONSULTING

WOODCREST PROJECT

Regional Vicinity

Exhibit 1



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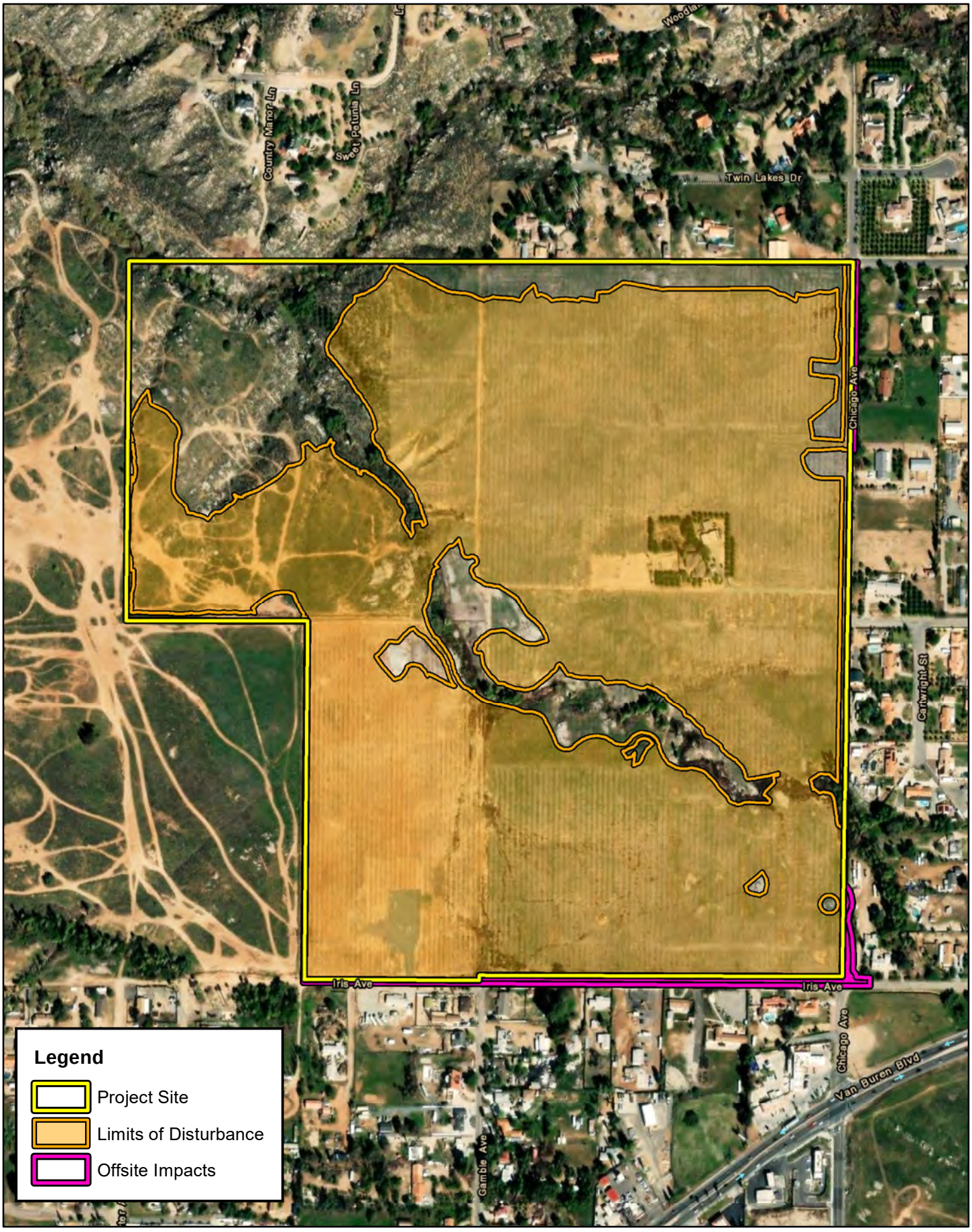
Source: USA Topographic Map, Riverside County

WOODCREST PROJECT

Site Vicinity

Exhibit 2



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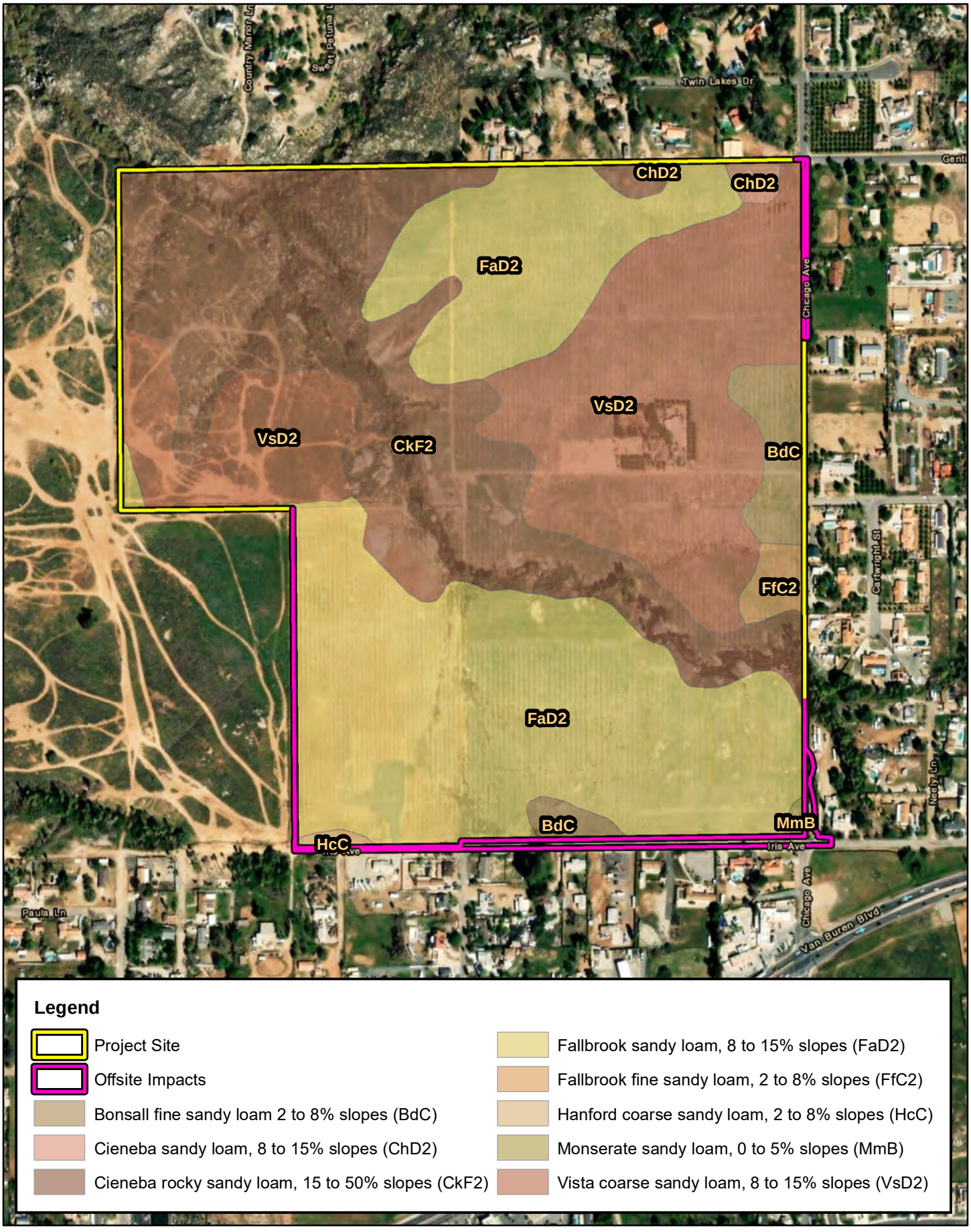
Source: ESRI Aerial Imagery, Riverside County

WOODCREST PROJECT

Project Site

Exhibit 3



ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, NRCS Soil Survey Geographic Database, Riverside County

WOODCREST PROJECT

Soils

Exhibit 4

ELMT CONSULTING

0 125 250 500 Feet

Source: ESRI Aerial Imagery, Riverside County

WOODCREST PROJECT

Riparian/Rivereine Habitat

Exhibit 5

ELMT CONSULTING

0 125 250 500 Feet

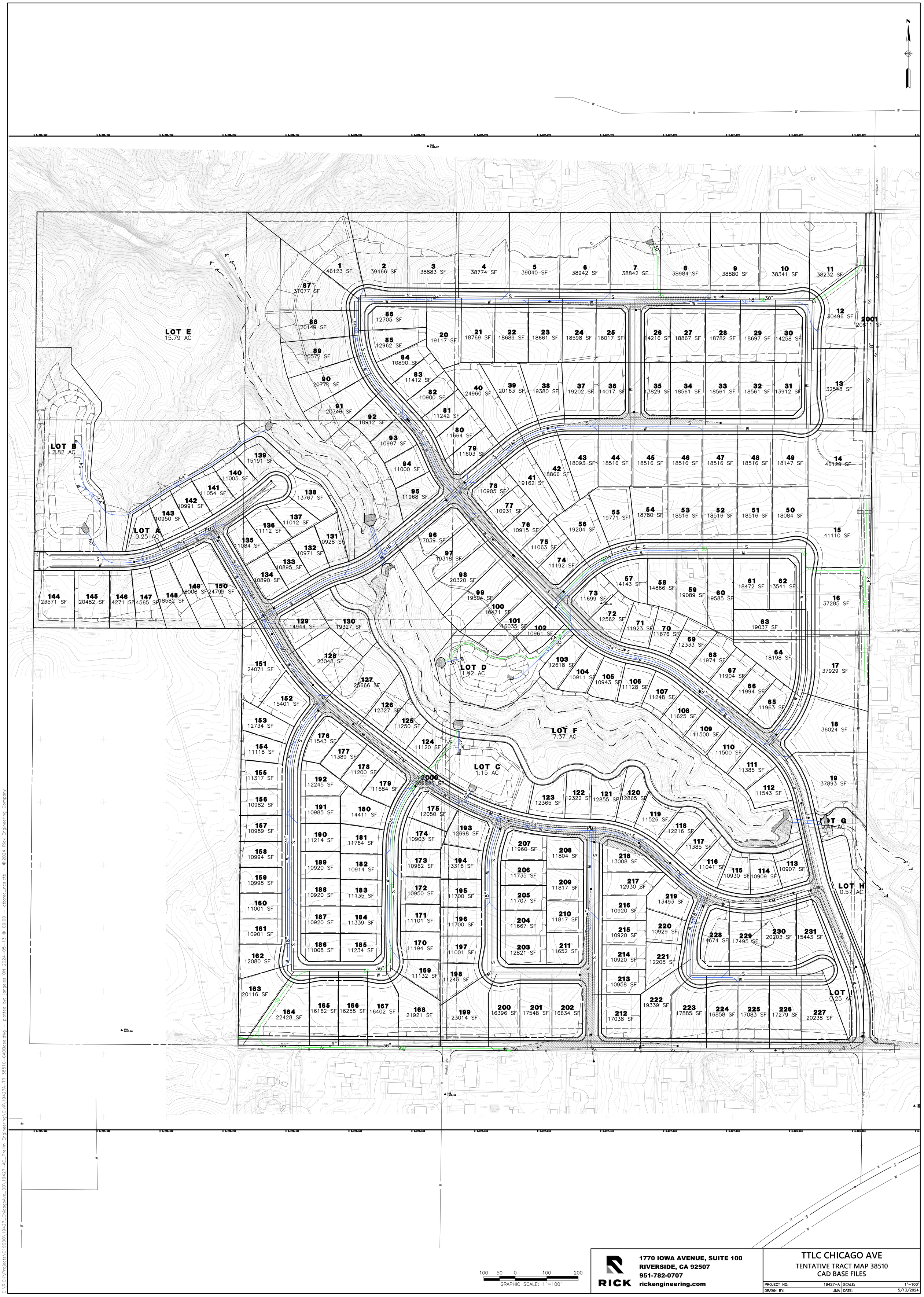
Source: ESRI Aerial Imagery, Riverside County

WOODCREST PROJECT

Riparian/Riverine Habitat Impacts

Exhibit 6

Appendix B Site Plan



100 50 0 100 200

GRAPHIC SCALE: 1"=100'

RICK
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951-782-0707
rickengineering.com

TTLC CHICAGO AVE

TENTATIVE TRACT MAP 38510
CAD BASE FILES

PROJECT NO:	19427-A	SCALE:	1"=100'
DRAWN BY:	JMA	DATE:	5/13/2024

C:\RICK\Projects\C19000\19427_ChicagoAve_DD\19427-AC_Prelim Engineering\Civil\19427A-TR 38510-CADBase.dwg — plotted by: jangeles ON 2024-05-13 @ 09:00 — ctb:rec_ncs.ctb — © 2024 Rick Engineering Company

Appendix C LBVI Survey

RESULTS OF 2024 LEAST BELL'S VIREO & SOUTHWESTERN WILLOW FLYCATCHER SURVEYS RIVERSIDE COUNTY, CALIFORNIA

SURVEYS CONDUCTED MAY 11-JULY 11, 2024

PERFORMED BY:

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AUGUST 5, 2024

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INTRODUCTION

Kidd Biological, Inc. (KBI) was contracted by to conduct protocol breeding season surveys for the southwestern willow flycatcher (*Empidonax traillii* extimus, SWFL) and least Bell's vireo (*Vireo bellii pusillus*, LBVI) on approximately 20 acres of suitable habitat in Woodcrest, California. The surveys were performed to satisfy requirements of the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP), under which SWFL and LBVI are considered covered species. In addition, under 6.1.2 of the MSHCP, surveys for these species must be conducted when there is potential for impacts to riparian habitats. The surveys followed protocol established for these species by the U.S. Fish and Wildlife Service (USFWS). Biologists Angela Johnson (ES 59592B-3) conducted three protocol SWFL surveys, and Jill Coumoutso (TE-93824C-0) conducted two protocol SWFL surveys. LBVI surveys were conducted by the above-mentioned biologists and by Jason Berkley. It should be noted a permit is not required to perform LBVI surveys.

PROJECT DESCRIPTION

TTLC Management proposes to develop a Tentative Tract Map (No. 38510) with 232 residential lots.

SURVEY LOCATION

The survey area is in an unnamed drainage feature that is southeast of the Woodcrest Dam in the Community of Woodcrest in western Riverside County. It is located in Section 24 of Township 3 South, Range 5 West of the Riverside East, California U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map (Figure 1). More specifically, the site is located east of Interstate 15, west of Interstate 215, southwest of Highway 91 and northwest of Highway 74 (Ortega Highway), and is northwest of the intersection of Van Buren Boulevard, Iris Avenue and Chicago Avenue (Figure 2).

HABITAT DESCRIPTION

The approximately 20-acre survey area is in a mixed residential area of an unincorporated area known as "Woodcrest". This area supports a mix of equestrian "ranchettes" (rural residential) as well as smaller single-family home parcels. This area was primarily used for citrus groves in the past. In recent years, the area has become more developed with housing tracts being constructed to the south and is now a suburb of the Cities of Riverside, Corona and Moreno Valley. There are

greenbelts between the tracts of homes that support native and naturalized vegetation communities.

The "Project Site" is 115.63 acres. The majority of the site, 104 acres, is comprised of non-native grasslands. The rest of the site supports: Riversidean sage scrub (7.62 acres), and southern willow scrub (2.90 acres). The remaining areas are classified as disturbed and developed.

The drainage feature that bisects the project site primarily supports a southern willow scrub plant community. This plant community is dominated by arroyo willow (*Salix lasiolepsis*) and black willow (*S. goodingii*) and supports a variety of other trees and shrubs with an herbaceous understory. Other common species observed in the southern willow scrub plant community include Mexican fan palm (*Washingtonia robusta*), salt cedar (*Tamarix* sp.), giant creek nettle (*Urtica dioca*), mule fat (*Baccharis salicifolia*), elderberry *(Sambucus mexicana* [*S. caerulea*]), bowlesia (*Bowlesia incana*), California bee plant (*Scrophularia californica*), common phacelia (*Phacelia distans*), Douglas' nightshade (*Solanum douglasii*), goldfields (*Lasthenia glabrata*), hairy leaved sunflower (*Helianthus annuus*), London rocket (*Sisymbrium irio*), needle goldfields (*Lasthenia gracilis*), stinknet (*Oncosiphon pilulifer*), virgin's bower (*Clematis pauciflora*), barley (*Hordeum murinum*), and willow baccharis (*Baccharis salicina*).

The presence of riparian vegetation suggests that this habitat has the potential to support both riparian least Bell's vireo and Southwestern Willow Flycatcher, however the proximity of residential development and the presence of recreational hiking and off-road trails, likely limits the use of this area for nesting by the SWFL which are less tolerant of human disturbance. The site does not support riparian forest habitat that is suitable for the Yellow Billed Cuckoo (*Coccyzus americanus*).

Southwestern Willow Flycatcher

Species Description, Distribution, and Status

The SWFL is a small, insectivorous passerine that migrates north in the spring from South America, Mexico, and Central America, to breed in the southwestern desert riparian habitats of California, Arizona, New Mexico, and Texas. Within western Riverside County there are very few reported occurrences with the majority occurring within the Prado Basin. The most current estimated number of range-wide flycatcher territories is 1,299 (288 breeding pairs) (USFWS 2014, Durst et al. 2008).

The SWFL occurs in riparian woodland habitat that is characterized by a dense growth of willows, mulefat, arrowweed (*Pluchea* sp.), cottonwood, sycamore (*Platanus* sp.), and tamarisk. In

addition to willow riparian woodland, the SWFL also nests in coast live oak woodland on the upper San Luis Rey River, San Diego County, California, in dense stands of tamarisk on the lower Colorado River, Imperial and Riverside Counties, California. Surface water or saturated soils are usually present in or adjacent to nesting thickets. The loss of habitat and parasitism by cowbirds are thought to be the major reasons for the declining numbers of SWFL (Pike et al, 2004, Kus 2002). The southwestern subspecies of willow flycatcher was federally listed as endangered in February 1995 (USFWS 1995). Critical habitat was established in 2005, and then revised in 2013. California Department of Fish and Wildlife (CDFW) determined that all subspecies in California are endangered under the California Endangered Species Act. Determining subspecies is based on the region the flycatcher is found breeding as they are nearly indistinguishable by site or call.

SWFL Survey Methods

Presence/absence surveys were conducted according to the July 11, 2000 revised protocol for project-related surveys and the general guidelines described by Sogge *et al.* (2010). All potential SWFL habitat and riparian areas within the survey area were surveyed five (5) times: one (1) visit during the 1st Survey Period (May 15 to May 31), two (2) visits during the 2nd Survey Period (June 1 to June 24), and two (2) visits during the 3rd Survey Period (June 25 to July 17). Each visit was at least five (5) days apart. Surveys of the sites were conducted during morning hours and when the temperature exceeded 13°C (55°f). Less than 1.9 miles (3 km) of habitat were surveyed per day. Surveys for the SWFL were conducted concurrently with those for the LBVI when schedules allowed, however the survey for each species was done on separate passes (e.g. LBVI was surveyed from the south to north transect, while SWFL were surveyed for during the north to south transect).

Surveys were conducted within all potential habitat patches. If a singing SWFL was not heard in an area after one to two minutes, a permitted biologist played a taped vocalization for 15 to 30 seconds and observed the area for responding SWFLs. This was repeated every 20 to 30 meters. If a SWFL was detected, tape playing was discontinued.

Any SWFL observations would be recorded in a field data form (found in Appendix C), and GPS readings of the locations were taken during the surveys. If this species was observed, their behavior, numbers, and locations of paired or unpaired birds; ages; and sexes of encountered SWFL would be noted. The biologist also checked for leg bands.

Least Bell's Vireo

Species Description, Distribution, and Status

The LBVI is a small greenish-gray songbird with a white underbelly, two white wingbars, and white spectacles across the lores. The LBVI was once widespread throughout the Central Valley and other low elevation river valleys of California. Historically, the LBVI's breeding range extended from the interior of northern California to northwestern Baja California (Grinnell and Miller 1944). The LBVI typically prefers riparian areas dominated by willows of mixed age composition. These areas frequently include other trees such as western cottonwood and California sycamore, with a. It has been noted that the most critical structural component of LBVI's habitat in California was the presence of a dense understory of young willows, mulefat, California wild rose (*Rosa californica*), and a variety of other shrubby species (Goldwasser 1981, Franzreb 1989). Territory sizes of LBVI in California have been reported to range from 0.3-1.3 hectares (0.75-3.2 acres) (Kus, et al. 2010). It was noted by Newman (1992) that "variability in territory size was unrelated to vegetation structure, and did not influence reproductive success of pairs in Southern California."

Within western Riverside County the core populations are primarily Prado Basin and the Santa Ana River, with other smaller populations in Temescal Wash (including Alberhill Creek), Mockingbird Canyon, Murrieta Creek, Temecula Creek, Lake Skinner (including Rawson Canyon), Vail Lake, Wilson Creek, and San Timoteo Canyon. According to the MSHCP "other geographic locations that are recorded within the UC Riverside database and by the USFWS include: Lake Elsinore, March Air Reserve Base, Meadowbrook, Canyon Lake, De Luz Creek, Potrero Creek, Bautista Creek, and Reche Canyon (USFWS 1998, CNDDB 2024)."

Loss and degradation of breeding habitat has been the greatest contributor to the decline of the LBVI and SWWF. Habitat conversion for agricultural purposes has removed much of the original riparian woodland, and flood control measures and channelization have further depleted the riparian habitats used by the LBVI and SWWF as well as other riparian birds. Another major contributing factor to the decline of the LBVI and SWWF was the introduction of the brown-headed cowbird (*Malothrus ater*) to California around 1890. Estimates from a 1989 study concluded that anywhere from 47% to 100% of all LBVI nests contained cowbird eggs (Franzreb 1989). The significant reduction in the population size and range of the vireo resulted in it being listed as a state endangered species in June 1980, and federally listed as endangered in May 1986. Critical Habitat for this species was designated in 1994; however, no critical habitat occurs within the survey areas.

LBVI Survey Methods

Presence/absence surveys were conducted according to the USFWS *Least Bell's Vireo Survey Guidelines* (2001). All potentially suitable LBVI habitat within the survey areas were surveyed seven (7) times between April 11 and July 15, 2024 with at least 10 days between survey visits for each site. The surveys were conducted during the morning hours during appropriate weather conditions. Some survey days continued into the early afternoon if weather conditions and bird activity remained conducive for bird detection. Less than three linear kilometers (km) (1.9 miles) of habitat were surveyed per day. LBVI surveys were conducted passively, listening for vireo songs, calls, whisper songs, scolds and visually looking for adults and juveniles. Any nesting behavior was also noted. Because LBVI were determined to be present in the project area and the surveyors were confident in the territory numbers, a final 8th survey was not performed.

LBVI observations were recorded in a field notebook, and GPS readings of the locations were taken during the surveys. If an exact point could not be taken, estimated points were determined post-survey. Numbers and locations of paired or unpaired territorial males, and the ages and sexes of encountered vireos (when discernible) were noted. Individual LBVI were also checked for colored leg bands.

Results

Surveys for LBVI and SWFL were conducted in all suitable habitat by permitted biologist's Jason Berkley, Angela Johnson and Jill Coumoutso between May 11 and July 11, 2024. Surveys were conducted where it was determined to support suitable habitat. Based on the level of effort and environmental conditions all surveys were considered valid as they followed published protocols. No SWFL were detected during the 2024 season.

A brief description of SWFL/LBVI survey results for the survey area is provided below. Data sheets for each of the SWFL surveys can be found in Appendix C.

Table 1. Survey Conditions

Survey #	Date	Surveyor	Start Time	Stop Time	Weather	Temp. Range (°F)	# SWFL Detected	# LBVI Detected
1	5/11/24	JB	0730	1030	0-100% CC, wind 1-2 mph	56-67	N/A	3
*2	5/21/24	JC	0600	0945	95-100% CC, wind 0-1 mph	55-61	0	4

*3	5/31/24	AJ	0645	1000	80-100% CC, (fog) wind 1-2 mph	56-62	0	5
*†4	6/10/24	AJ	0655	1100	30-100% CC, Wind 1-2 mph	58-64	0	5
*5	6/21/24	AJ	0609	1015	0% CC, Wind 1-4 mph	63-74	0	5
*6	7/3/24	JC	0557	0906	0% CC, wind 0-1 mph	66-80	0	6
7	7/11/24	AJ	0545	0945	30-50% CC, Wind 1-4 mph	67-80	N/A	5

** Indicates LBVI and SWFL surveys conducted on the same day.*

† Indicates SWFL surveys ended at 1030 protocol time, as LBVI surveys continued after

TABLE 2. LBVI LOCATIONS (UTM- ZONE 11S)

LBVI Territory	Easting	Northing
LBVI 1 (off site)	467219	3750459
LBVI 2	467131	3750472
LBVI 3	467155	3750394
LBVI 4	467213	3750281
LBVI 5	467285	3750157
LBVI 6	467389	3750017
When LBVI were detected in multiple locations, only the central point of the polygon is given.		

All three surveyors noted at least 6 territories during the course of the surveys. Figure 2 illustrates the locations of the territories. One territory is just offsite to the north of the project boundaries. The birds from this territory did appear to forage into the subject property boundaries.

There were two other questionable detections, one just to the northwest of the survey area. Here, a male was seen foraging in a small stand of willows, likely a seep or spring. The male was seen

flying to the northeast, back to the mail drainage feature. It could not be determined if this was the male from Territory 2, or a male from a separate, off-site territory.

The second is a male that was detected during more than one survey, but not during all surveys at the southeast portion of the site. This male may have a territory off site to the east, or it may be a male from Territory 6, or it may have been attempting to establish a territory but failed to do so and moved to another area.

Other Listed and Sensitive Species Observed

This survey focused on two species, the LBVI and SWFL; however, incidental observation(s) of all federal listed and state listed/sensitive species were documented. A total of eight (8) sensitive species were observed. Table 3 describes these. Of note, there were three California gnatcatcher territories documented.

There are various definitions of "sensitive" in accordance with State and Federal Agencies. The following is a brief summary of the status of the species that were observed on site (all definitions were taken directly from the CDFW Biogeographic Data Branch's Special Animals list [July 2024] unless otherwise indicated):

U.S. Fish and Wildlife Service Federally Endangered (FE): The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range as defined in the Endangered Species Act.

U.S. Fish and Wildlife Service Federally Threatened (FT): Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range as defined in the Endangered Species Act.

CDFW State Endangered (SE): a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease. Any species determined by the commission as "endangered" on or before January 1, 1985, is an "endangered species."

CDFW California Species of Special Concern (**SSC):** The Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of

designating species as "SSC" is to halt or reverse their decline early enough to secure their long-term viability.

CDFW: Watch List (WL): The birds on this Watch List are 1) not on the current Special Concern list but were on previous lists and they have not been state listed under CESA; 2) were previously state or federally listed and now are on neither list; or 3) are on the list of "Fully Protected" species.

TABLE 3. OTHER LISTED OR SENSITIVE SPECIES OBSERVED

Common Name	Scientific Name	Status
Bell's sparrow	*Artemisiospiza belli belli*	WL
California gnatcatcher	*Polioptila californica*	FT, SSC
California horned lark	*Eremophila alpestris*	WL
Cooper's hawk	*Accipiter cooperi*	WL
So. California Rufous-crowned sparrow	*Aimophila ruficeps canescens*	WL
Yellow warbler	*Setophaga petechial*	SSC
San Diego Black-tailed Jackrabbit	*Lepus californicus bennettii*	SSC

BROWN-HEADED COWBIRDS AND INVASIVE SPECIES

Brown-headed cowbirds (*Molothrus ater*) (BHCO) were detected during three (3) of the surveys in 2024. They were observed on 5/31, 6/10, on 6/21 with juvenile BHCO being observed on the 6/21 survey. No cowbird traps were noted at the survey site. Nest searches were not performed, so it is not known if the BHCOs parasitized LBVI nests.

There were five invasive plant species within the survey area: Arundo (*Arundo donax*), salt cedar (*Tamarisk* sp.), Peruvian pepper (*Schinus molle*), tree tobacco (Nicotiana glauca) and Mexican fan palms (*Washingtonia robusta*). None of these species was found to be heavily abundant in the survey area except for a grove of Mexican fan palms at the south end of the survey area. Salt

cedar was found scattered throughout the survey area, and although an invasive plant, it is regularly used by SWFLs and other riparian birds for foraging and nesting.

Although this species out-competes native plant species, the small extent of salt cedar in this area does not likely have a significant impact on the population of sensitive birds in the area. However, if salt cedar should spread and dominate a substantial portion of the southern willow scrub in the surrounding area, the diversity of invertebrates in the willow riparian habitat may decline. The result of decreased abundance and diversity of invertebrates likely affects species at higher trophic levels (Baily et al 2001).

CONCLUSION

No SWFL were detected during the 2024 surveys. A total of six (6) LBVI territories were found within the study area. At least four fledglings were observed during the surveys indicating that this riparian habitat is substantial enough and productive enough to support breeding and is possibly valuable for the species in the region. Additionally, the biologists detected three California gnatcatcher territories in the sage scrub habitat immediately surrounding the survey area.

Other sensitive species detected included Cooper's hawk, yellow warbler, Bell's sparrow, California horned lark, southern California rufous-crowned sparrow, California gnatcatcher, and black-tailed jackrabbit.

CERTIFICATION

I certify that the information in this survey report and attached exhibits, fully and accurately represent my work.

Date: August 5, 2024 Signed: _____
Angela Johnson ES 59592B-3

Date: August 5, 2024 Signed: _____
Jill Coumoutso TE 93824C-0

Date: August 5, 2024 Signed: _____
Jason Berkley

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Zembal, R. 2015. Personal communication between R. Zembal, Natural Resources Director of the Orange County Water District regarding 2014 and 2015 observations of SWFL at Prado Basin. Email dated September 1, 2015

APPENDIX A- FIGURES

FIGURE 1. SURVEY LOCATION ON RIVERSIDE EAST, CA USGS TOPOGRAPHIC MAP (1:24,000 SCALE)

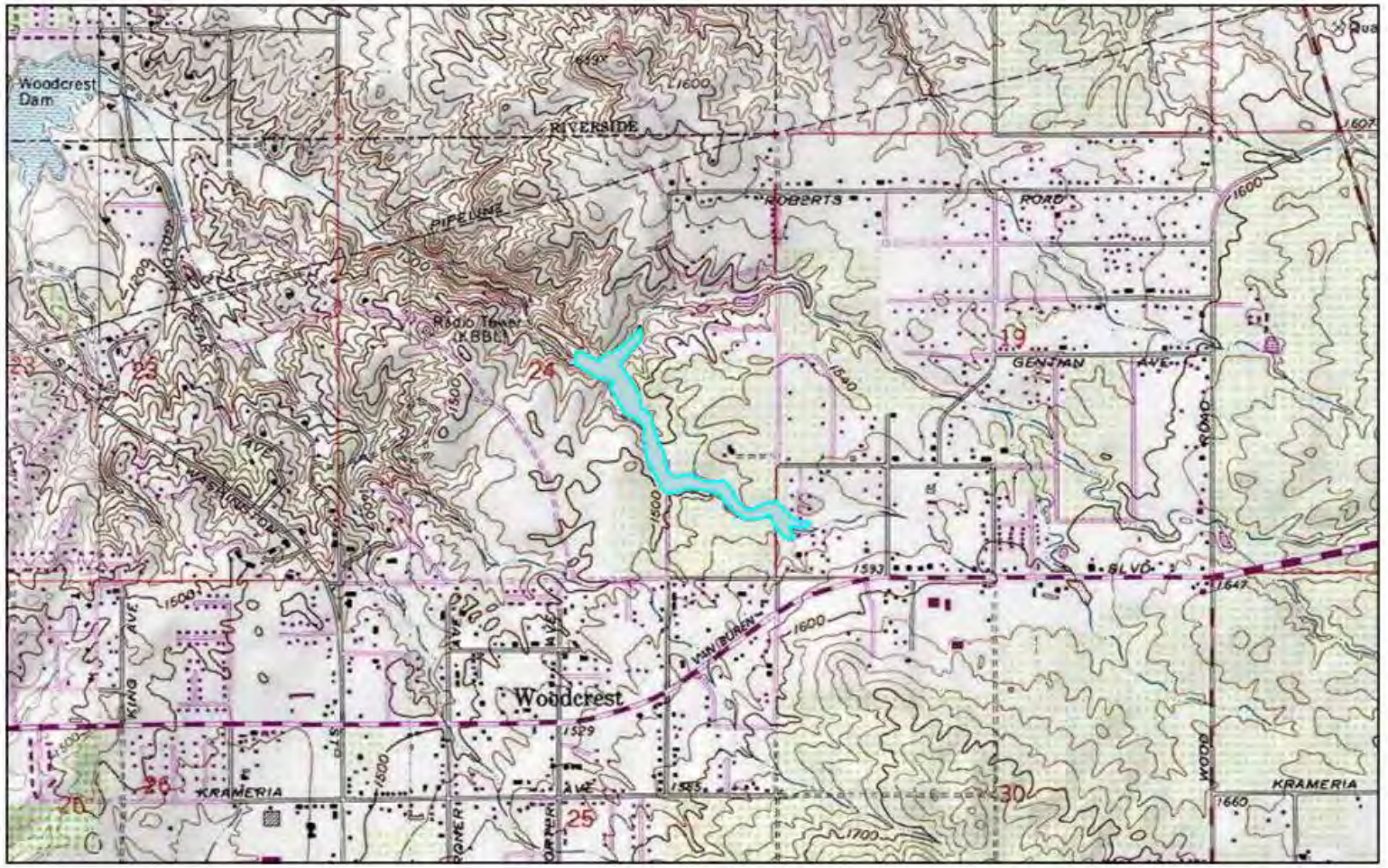
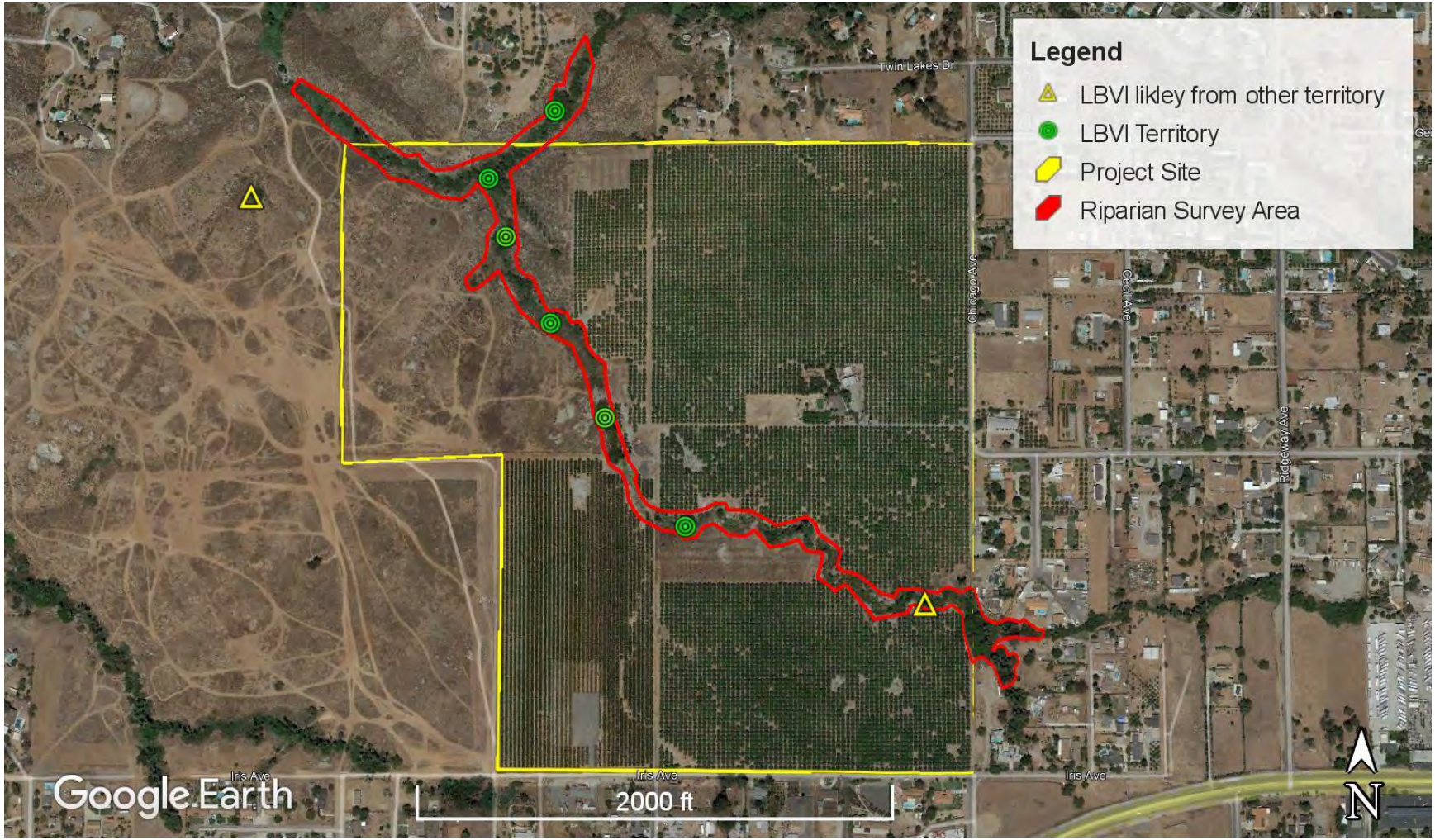


FIGURE 2. AERIAL PHOTO OF SURVEY LOCATION AND LBVI OBSERVATIONS



APPENDIX B- FAUNAL COMPENDIUM

AVES
Allen's Hummingbird (*Selasphorus sasin*)
American Crow (*Corvus brachyrhynchos*)
American Goldfinch (*Spinus tristis*)
American Kestrel (*Falco sparverius*)
American Robin (*Turdus migratorius*)
Anna's Hummingbird (*Calypte anna*)
§ Bell's Sparrow (*Aretemisiospiza belli belli)*
§ Bell's Vireo (Least) (V*ireo bellii pusillus*)
Bewick's Wren (*Thryomanes bewickii*)
Black-chinned Hummingbird (*Archilochus alexandri)*
Black-headed Grosbeak (*Pheucticus melanocephalus)*
Black Phoebe (*Sayornis nigricans*)
Brown-headed Cowbird (*Molothrus ater*)
Blue Grosbeak (*Passerina caerula*)
Bushtit (*Psaltriparus minimus*)
§ California Gnatcatcher (*Polioptila californica*)
§ California Horned Lark (*Eremophila alpestris actia*)
California Quail (*Callipepla californica*)
California Scrub-Jay (*Aphelocoma californica*)
California Thrasher (*Toxostoma redivivum*)
California Towhee (*Melozone crissalis*)
Cassin's Kingbird (*Tyrannus vociferans*)
Cliff Swallow (*Petrochelidon pyrrhonota*)
Common Raven (*Corvus corax*)
Common Yellowthroat (*Geothlypis trichas*)
§ Cooper's Hawk (*Accipiter cooperii*)

	Great Horned Owl (*Bubo virginianus*)
	Greater Roadrunner (*Geococcyx californianus*)
	Hooded Oriole (*Icterus cucullatus*)
	House Finch (*Haemorhous mexicanus*)
*	House Sparrow (*Passer domesticus*)
	House Wren (*Troglodytes aedon*)
	Killdeer (*Charadrius vociferus*)
	Lesser Goldfinch (*Spinus psaltria*)
	Mourning Dove (*Zenaida macroura*)
	Northern Flicker (Red-shafted) (*Colaptes auratus* [cafer Group])
	Northern Mockingbird (*Mimus polyglottos*)
	Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)
	Nuttall's Woodpecker (*Dryobates nuttallii*)
	Phainopepla (*Phainopepla nitens*)
	Red-shouldered Hawk (*Buteo lineatus*)
	Red-tailed Hawk (*Buteo jamaicensis*)
§	Rufous-crowned Sparrow (*Aimophila ruficeps*)
	Say's Phoebe (*Sayornis saya*)
*	Scaly-breasted Munia (*Lonchura punctulata*)
	Song Sparrow (*Melospiza melodia*)
	Spotted Towhee (*Pipilo maculatus*)
	White-throated Swift (*Aeronautes saxatalis*)
	Wrentit (*Chamaea fasciata*)
§	Yellow Warbler (*Setophaga petechia*)
MAMMALIA	
§	San Diego black-tailed jackrabbit (*Lepus califronicus bennettii*)
	California Ground Squirrel (*Otosperophilus beecheyi*)

Coyote (*Canis latrans*)
Desert Cottontail (*Sylvilagus audubonii*)
REPTILIA
Granite Spiny Lizard (*Sceloporous orcutii*)
Western Fence Lizard (*Sceloporus occidentalis*)
Western Side-blotched Lizard (*Uta stansburiana elegans*)

*Introduced Species

§ Sensitive- Watch List Species

Taxonomic nomenclature follows American Ornithologists ' Union 1998 and all updates for birds, and California Department of Fish and Wildlife's, Natural Diversity Database, April 2024 for special-status.

APPENDIX C- SWFL SURVEY DETECTION FORMS

Appendix 1. Willow Flycatcher Survey and Detection Form

Always check the U.S. Fish and Wildlife Service Arizona Ecological Services Field Office web site (http://www.fws.gov/southwest/es/arizona/) for the most up-to-date version.

Willow Flycatcher (WIFL) Survey and Detection Form (revised April 2010)

Site Name SE of Woodcrest Dam State CA County Riverside
USGS Quad Name Riverside East Elevation 455 (meters)
Creek, River, Wetland, or Lake Name Unnamed Drainage
Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? *Yes*___ *No*___

Survey Coordinates: Start: E 466878 N 3750556 UTM Datum 11 (See instructions)
Stop: E 467843 N 3749880 UTM Zone 5
If survey coordinates changed between visits, enter coordinates for each survey in comments section on back of this page.
** ***Fill in additional site information on back of this page*** **

Survey # / Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N. If Yes, number of nests	Comments (e.g., bird behavior; evidence of pairs or breeding; potential threats [livestock, cowbirds, *Diorhabda* spp.]). If *Diorhabda* found, contact USFWS and State WIFL coordinator	GPS Coordinates for WIFL Detections (this is an optional column for documenting individuals, pairs, or groups of birds found on each survey). Include additional sheets if necessary.			
							# Birds	Sex	UTM E	UTM N
Survey # 1 Observer(s) A. Johnson	Date 6/10/24 Start 0695 Stop 1030 Total hrs 3.6	0				2 BHCO present. 1 Adult and 1 Juvenile				
Survey # 2 Observer(s) A. Johnson	Date 6/21/24 Start 0609 Stop 0950 Total hrs 3.7	0				3 BHCO present. 2 Adults and 1 juvenile.				
Survey # 3 Observer(s) A. Johnson	Date 7/11/24 Start 0545 Stop 0930 Total hrs 3.75	0				NO BHCO				
Survey # 4 Observer(s)	Date Start Stop Total hrs ___									
Survey # 5 Observer(s)	Date Start Stop Total hrs ___									

Overall Site Summary	Total Adult Residents	Total Pairs	Total Territories	Total Nests	
Totals do not equal the sum of each column. Include only resident adults. Do not include migrants, nestlings, and fledglings. Be careful not to double count individuals. Total Survey Hrs 11.05	0				Were any Willow Flycatchers color-banded? Yes___ No___ If yes, report color combination(s) in the comments section on back of form and report to USFWS.

Reporting Individual Angela Johnson Date Report Completed 7/30/2024
US Fish and Wildlife Service Permit # 51572B-3 State Wildlife Agency Permit # S-200340007
Submit form to USFWS and State Wildlife Agency by September 1st. Retain a copy for your records.

32 **A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher**

Fill in the following information completely. Submit form by September 1st. Retain a copy for your records.

Reporting Individual Angela Johnson Phone # 970-412-4777
Affiliation Kidd Biological Inc. E-mail angela@kiddbioinc.com
Site Name SC of Woodcrest Dam Date Report Completed 7/30/24
Was this site surveyed in a previous year? Yes ___ No ___ Unknown ✓
Did you verify that this site name is consistent with that used in previous years? Yes ___ No ___ Not Applicable ✓
If site name is different, what name(s) was used in the past? ___
If site was surveyed last year, did you survey the same general area this year? Yes ✓ No ___ If no, summarize below.
Did you survey the same general area during each visit to this site this year? Yes ✓ No ___ If no, summarize below.

Management Authority for Survey Area: Federal ___ Municipal/County ___ State ___ Tribal ___ Private ✓
Name of Management Entity or Owner (e.g., Tonto National Forest) ___

Length of area surveyed: 1.8 (km)

Vegetation Characteristics: Check (only one) category that best describes the predominant tree/shrub foliar layer at this site:

___ Native broadleaf plants (entirely or almost entirely, > 90% native)

✓ Mixed native and exotic plants (mostly native, 50 - 90% native)

___ Mixed native and exotic plants (mostly exotic, 50 - 90% exotic)

___ Exotic/introduced plants (entirely or almost entirely, > 90% exotic)

Identify the 2-3 predominant tree/shrub species in order of dominance. Use scientific names.
Salix lasiolepsis, Salix goodingii, Baccharis salicifolia

Average height of canopy (Do not include a range): 6 (meters)

Attach the following: 1) copy of USGS quad/topographical map (REQUIRED) of survey area, outlining survey site and location of WIFL detections; 2) sketch or aerial photo showing site location, patch shape, survey route, location of any detected WIFLs or their nests; 3) photos of the interior of the patch, exterior of the patch, and overall site. Describe any unique habitat features in Comments.

Comments (such as start and end coordinates of survey area if changed among surveys, supplemental visits to sites, unique habitat features. Attach additional sheets if necessary.

Territory Summary Table. Provide the following information for each verified territory at your site.

Territory Number	All Dates Detected	UTM E	UTM N	Pair Confirmed? Y or N	Nest Found? Y or N	Description of How You Confirmed Territory and Breeding Status (e.g., vocalization type, pair interactions, nesting attempts, behavior)

Attach additional sheets if necessary

Willow Flycatcher Survey and Detection Form (revised April, 2004)

Site Name Woodcrest State CA County Riverside
USGS Quad Name Riverside East Elevation _____ feet / meters (circle one)

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)? ☐ ***Yes*** ☐ ***No***

Site Coordinates: Start: N 466878 E 3750556 UTM Datum 11 (NAD27 preferred)
Stop: N 467843 E 3749880 UTM Zone S

***** Fill in additional site information on back of this page *****

Survey # / Observer(s) (Full Name)	Date (m/d/y) Survey time	Number of Adult WIFLs	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found ? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign, If Yes, Describe Y or N	Comments about this survey (e.g., bird behavior, evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
1 Jill Coumoutso	Date 5/21/24 Start 0600 Stop 0945 Total hrs 3.75	0	0	0	0	N	N	
2	Date Start Stop Total hrs							
3	Date Start Stop Total hrs							
4	Date Start Stop Total hrs							
5 Jill Coumoutso	Date 7/3/24 Start 0557 Stop 0906 Total hrs 3.0	0	0	0	0	N	N	
Overall Site Summary (Total **resident** WIFLs only) Total survey hrs		Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? Yes No If yes, report color combination(s) in the comments section on back of form		

Reporting Individual _____ Date Report Completed _____
US Fish and Wildlife Service Permit #_____ AZ Game and Fish Department (or other state) Permit # _____

Submit original form by August 1st. Retain a copy for your records.

Fill in the following information completely. Submit original form by August 1st. Retain a copy for your records.

Reporting Individual Jill Coumoutso Phone #
Affiliation Kidd Biological, Inc E-mail JCBiological@gmail.com
Site Name Woodcrest TTLC Date Report Completed 7/1/2024

Did you verify that this site name is consistent with that used in previous years? Yes (No) (circle one)
If name is different, what name(s) was used in the past?
If site was surveyed last year, did you survey the same general area this year? Yes / No If no, summarize in comments below.
Did you survey the same general area during each visit to this site this year? Yes (No) If no, summarize in comments below.

Management Authority for Survey Area (circle one): Federal Municipal/County State Tribal (Private)
Name of Management Entity or Owner (e.g., Tonto National Forest) TTLC Management Comany

Length of area surveyed: 1.8 km (specify units, e.g., miles = mi, kilometers = km, meters = m)

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

☐ Native broadleaf plants (entirely or almost entirely, includes high-elevation willow)

☒ Mixed native and exotic plants (mostly native)

☐ Mixed native and exotic plants (mostly exotic)

☐ Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: Salix lasiolepis, S. goodingi, Baccharis salicifolia

Average height of canopy (Do not put a range): 6 meters (specify units)

Was surface water or saturated soil present at or adjacent to site? Yes / No (circle one)
Distance from the site to surface water or saturated soil: (specify units)

Did hydrological conditions change significantly among visits (did the site flood or dry out)? Yes (No) (circle one)
If yes, describe in comments section below.

Remember to attach a copy of a USGS quad/topographical map (REQUIRED) of the survey area, outlining the survey site and location of WIFL detections. Also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map. Please include photos of the interior of the patch, exterior of the patch, and overall site and describe any unique habitat features.

Comments (attach additional sheets if necessary)

WIFL Detection Locations:

Date Detected	N UTM	E UTM	Date Detected	N UTM	E UTM

APPENDIX D- SITE PHOTOS

1. Northern survey area

2. Northern survey area

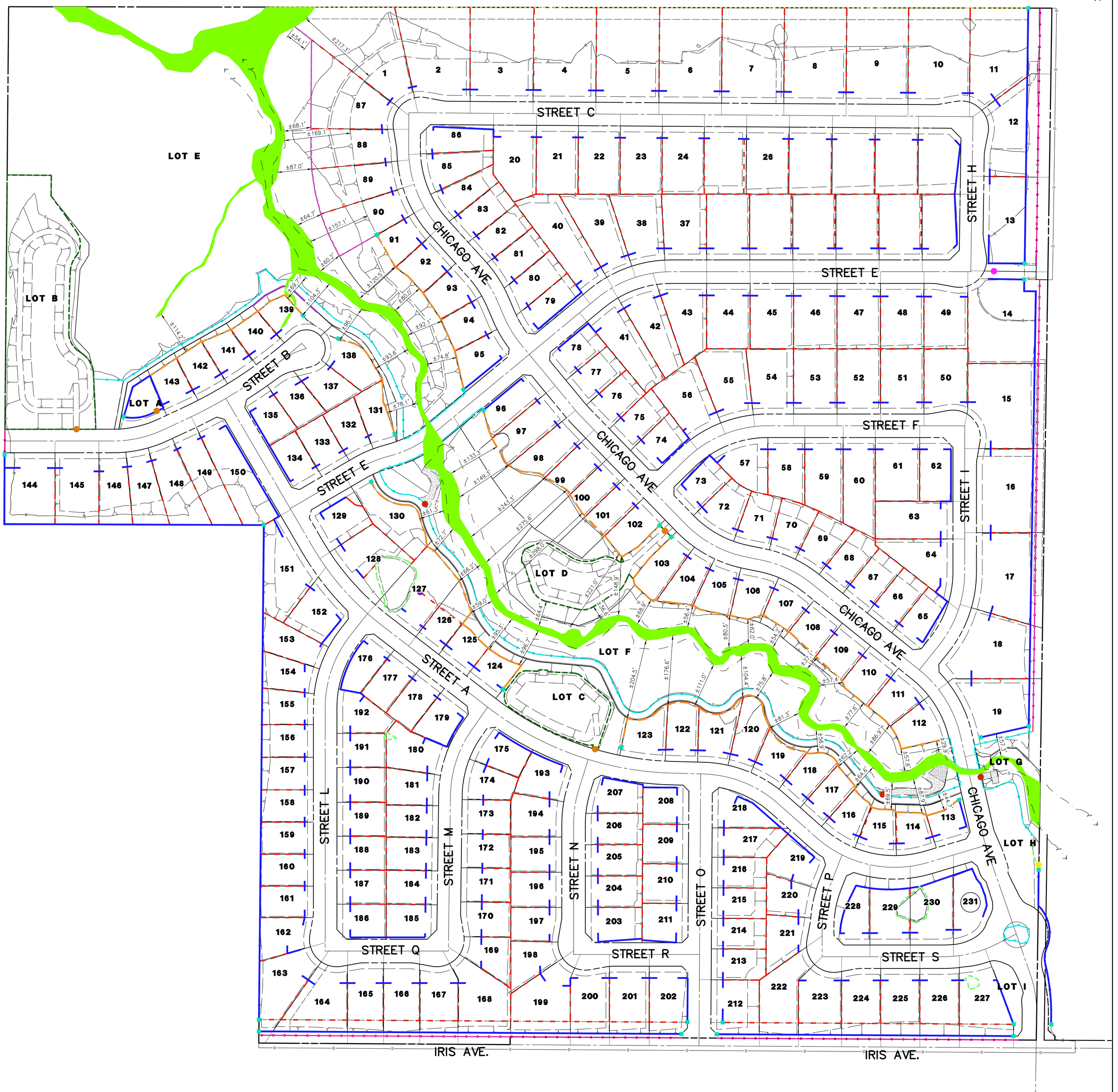
3. Central survey area

4. Central Survey area

5. Southern survey area

6. Southern survey area

Appendix D Fence and Wall Plan with Riparian/Riverine Habitat Setbacks



LEGEND

RIPARIAN/RIVERINE HABITAT

100–YR WATER SURFACE ELEVATION (WSE)

AVERAGE SETBACK: ±98'
(BETWEEN RIPARIAN/RIVERINE AND LOT WALL/FENCE)

SYMBOL	DESCRIPTION	DETAIL
	6' TYPICAL PRIVACY VINYL FENCE (LAST 5' NON–COMBUSTIBLE)	12
	6' TUBULAR STEEL VIEW FENCE	4
	4' TUBULAR STEEL VIEW FENCE	8
	6' HIGH MASONRY WALL (SOLID NON–COMBUSTIBLE – PER FUEL MOD. REQUIREMENTS)	1
	3' SPLIT RAIL WOOD FENCE	9
	RETAINING WALL PER PLANS BY CIVIL ENGINEER	
	SOLID CMU WALL OR MATERIAL APPROVED OTHERWISE BY RCFD/CAL FIRE	1
	6' DOUBLE PICKET TUBULAR STEEL FENCE	3
	4' SPLIT RAIL WOOD FENCE WITH WIRE MESH	6
	6'–6" HIGH MASONRY PILASTER	1
	FIRE ACCESS GATE	5
	VINYL OR WROUGHT IRON VIEW FENCE OPTION	2 OR 4
	MAINTENANCE ACCESS POINT	
	TUBULAR STEEL MAINTENANCE GATE	10
	VINYL MAINTENANCE GATE	7
	TUBULAR STEEL VIEW FENCE GATE	11

100 50 0 100 200
GRAPHIC SCALE: 1"=100'

RICK
1770 IOWA AVENUE, SUITE 100
RIVERSIDE, CA 92507
951-782-0707
rickengineering.com

ARROYO VISTA TTM 38510

RIPARIAN/RIVERINE HABITAT SETBACKS

PROJECT NO:	19427	SCALE:	1"=100'
DRAWN BY:	JMA	DATE:	1/9/2025

\\cp.rickeng.com\projects\C19000\19427_ChicagoAve_DD\19427-AC_Prelim Engineering\Civil\Exhibits\19427A-EXB022-RiparianRiverineSetbacks.dwg – plotted by: jangeles ON 2025-01-09 @ 16:25 – ctbree_ncs_v2.ctb – ©2024 Rick Engineering Company

REDACTED FOR PUBLIC USE

Report Date: April 2022

Updated Phase 1 Cultural Resources Assessment for the Riverside Chicago Avenue Project, Riverside County, California

U.S. Geological Survey7.5-minute Quadrangles: Riverside East (1967 photorevised 1980)

Owner Applicant:
TTLC Management, Inc., An Arizona Corporation
2942 Century Place, Suite 121
Costa Mesa, CA 92626
(949) 261-7010

Prepared For:
County of Riverside Planning Department
4080 Lemon Street, 12th Floor, Riverside, CA 92501
(951) 955-2873

Prepared By:
ECORP Consulting, Inc.
215 N. Fifth Street
Redlands, CA 92374
(909) 307-0046
Principal Investigator: John O'Connor, Ph.D., RPA

Keywords: Perris, Riverside County, orchards, [redacted]

Results: Four previously recorded resources (P-33-012915/CA-RIV-7181, P-33-012916/CA-RIV-7182, P-33-012917/CA-RIV-7183, and P-33-012918/CA-RIV-7184) and two newly recorded resources (Field Numbers CA-001 and CA-002)

Report Preparers: Robert Cunningham, Sonia Sifuentes, RPA, Lisa Westwood, RPA (909) 307-0046

Field Personnel: Robert Cunningham (Field Director) and Julian Acuña, RPA (909) 307-0046

Riverside County Project Numbers: PAR210156

Riverside County APN: 245-300-001, 245-300-004

MANAGEMENT SUMMARY

TTLC Management, Inc., is filing a Site Plan for the Riverside Chicago Avenue Project, which consists of two parcels located in Riverside County, near the community of Woodcrest. In 2015, First Carbon Solutions (FCS) conducted a Phase I Cultural Resources Assessment in support of the Riverside Chicago Avenue Project (Project). The FCS 2015 report summarizes the results of the Phase I study that covered 140 acres. ECORP Consulting, Inc., (ECORP) conducted an update to the 2015 study in 2022. The purpose of the update was to include an additional 20 acres added to the Project Area since the original study, cover lapses in the original study, and to present data consistent with Riverside County standards. The Assessor's Parcel Numbers (APN) for the two properties included in the Project Area are 245-300-001 and 245-300-004. The total Project Area contains 160 acres of land.

Between December and April 2021, ECORP requested a cultural resources records search from the Eastern Information Center (EIC; University of California, Riverside), requested a search of the Sacred Lands File from the Native American Heritage Commission (NAHC), and conducted a field visit and a second intensive systematic pedestrian survey of the 160-acre Project Area.

The updated records search indicated that 55 cultural resources investigations have been conducted within the 1-mile records search radius between 1974 and 2016. Of these studies, two investigations overlapped the Project Area, covering more than 95 percent of the area. The records search also showed that [redacted] cultural resources have been recorded within or adjacent to the Project Area. [redacted] previously recorded cultural resources are located within 1 mile of the Project Area.

The results of the Sacred Lands File search by the NAHC did not indicate the presence of Native American sacred lands within the vicinity of the Project Area. In addition to the search of the Sacred Lands File, the NAHC identified 21 Native American groups and individuals with historical and traditional ties to the Project Area.

ECORP conducted field visits in February and April 2022 to document ground conditions and to revisit four previously recorded sites. During the field visits, ECORP confirmed the presence of the four previously recorded resources and updated site boundaries. Previously recorded sites consisted of [redacted] sites: P-33-012915, P-33-012916, P-33-012917, and P-33-012918.

In March 2022, ECORP conducted an intensive pedestrian survey of the 20-acre addition to the Project Area. As a result of the 20-acre survey, ECORP identified two newly recorded resources. The two newly recorded resources consist of [redacted]: CA-001 and CA-002. Surface visibility during the survey ranged from fair (60 percent) to poor (10 percent) throughout the entire Project Area. Due to poor ground visibility, there exists the potential for additional resources to be present within the Project Area; however, due to the past agricultural use of the property, in-situ cultural deposits are unlikely.

ECORP recommends that all known sites be avoided and preserved in place. If avoidance is not possible, ECORP recommends additional Phase II studies be conducted for resources that will be impacted by Project activities. In the event that one or more Historical Resource is within the Project Area and cannot

be avoided, further work including an impact assessment and, if warranted, mitigation in the form of data recovery may be required.

The Project Area has a high potential to contain unidentified surface-level resources that were obscured from view by heavy vegetation or wood debris from the removal of the citrus groves. Due to ground conditions and the presence of [redacted] within the property and within the general vicinity, ECORP recommends that a qualified archaeological monitor be present during vegetation removal for the Project to identify and assess surface and near-surface-level resources that may not have been visible at the time of the survey. The potential for the Project Area to contain unidentified subsurface resources is low based on the underlying sediments.

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LIST OF ACRONYMS AND ABBREVIATIONS

AB Assembly Bill
APN Assessor Parcel Number
BERD Built Environment Resource Directory
BP Before present
CEQA California Environmental Quality Act
CHRIS California Historical Resources Information System
CRHR California Register of Historical Resources
DPR Department of Parks and Recreation
ECORP ECORP Consulting, Inc.
EIC Eastern Information Center
FCS First Carbon Solutions
MLD Most Likely Descendant
NAHC Native American Heritage Commission
NRHP National Register of Historic Places
OHP Office of Historic Preservation
OHV Off-Highway Vehicle
PRC Public Resources Code
RPA Registered Professional Archaeologist

SB Senate Bill
U.S. United States of America
UCSB University of California, Santa Barbara
USGS U.S. Geological Survey

I INTRODUCTION AND SETTING

a. Project Description

In 2015, First Carbon Solutions (FCS) conducted a Phase I Cultural Resources Assessment of the Riverside Chicago Avenue Project (Project). TTLC Management proposes to construct a residential development on approximately 140 acres. In May 2015, FCS completed a Phase I Cultural Resources Assessment Report summarizing the results of the Phase I study that covered 140 acres (FCS 2015). Similarly, the cultural and historical context of the Project Area is summarized in the technical study prepared for the Project, which is also hereby incorporated by reference. The 2015 Phase I report is also included as Confidential Appendix A of this Update Report.

In the 2015 report, FCS provided results of a California Historical Resources Information System (CHRIS) records search for a 0.5-mile radius around the 140-acre Project Area. These results indicated the presence of four previously recorded precontact sites within the Project Area: CA-RIV-7181, CA-RIV-7182, CA-RIV-7183, and CA-RIV-7184. FCS conducted Phase I fieldwork for the Project in March and April 2015, and the field crew was unable to locate two of the previously recorded sites (CA-RIV-7183 and CA-RIV-7184). The report notes the presence of orchards throughout much of the Project Area and indicates the orchards were planted in the late 1960s (FCS 2015).

In 2022, TTLC Management added an additional 20-acre parcel to the Project, expanding the Project Area to a total of 160 acres. ECORP conducted an update to the 2015 study in 2022. The purpose of the update was to include the additional 20 acres added to the Project Area since the original study, cover lapses in the original study, and present data consistent with Riverside County standards. To this purpose, ECORP conducted an update to the CHRIS records search, expanding the records search area to the current standard of a 1.0-mile radius around the Project Area. ECORP requested an update to the Sacred Lands File search from the NAHC for any Tribal Cultural Resources that may have been documented since the 2015 study. ECORP conducted a field visit of the original 140-acre Project Area to document ground conditions since the removal of the historic-period orange grove, and to confirm the presence of the previously recorded resources within the Project Area. ECORP also conducted an intensive pedestrian survey of the additional 20 acres.

b. Project Location

The Project Area is located within the Woodcrest Area of unincorporated Riverside County, south of Twin Lakes Drive, north of Iris Avenue, west of Chicago Avenue, and east of an unnamed, unpaved road connecting Iris Avenue to Ridge Canyon Drive (Appendix B, Figure 1).

c. USGS Quad Location

As shown on the United States (U.S.) Geological Survey (USGS) 7.5-minute Riverside East, California topographic quadrangle map (1967, photorevised 1980), the Project Area is located in Sections 24, Township 3 South, Range 5 West of the San Bernardino Base and Meridian (Appendix B).

d. Field Personnel

Field personnel for the initial 140-acre site visit and the intensive pedestrian survey of the additional 20-acre parcel consisted of ECORP archaeologists Robert Cunningham (Field Director), and Julian Acuña, RPA. ECORP personnel qualifications are located in Appendix C.

Supplemental survey was monitored by tribal representative Edward Ortiz from the Pechanga Band of Luiseño Indians.

e. Topographic Description and Elevation

The Project Area is located in unincorporated western Riverside County, in the unincorporated community of Woodcrest, 7.39 miles east of the City of Norco, 5.09 miles northwest of the City of Perris, and 0.5 mile south of the City of Riverside. The Project Area is situated at an elevation of 1,403 to 1,571 feet above mean sea level in Mead Valley, located east of the Santa Ana Mountains and west of the San Jacinto Mountains in southern California. The San Bernardino Mountains are to the north. Local topography is undulating terrain crossed by seasonal streams. The climate of the Project Area is somewhat comparable to the high deserts of southern California, though with a more moderate coastal temperature range than the inland deserts.

f. Disturbance and Present Land Use

The eastern portion of the Project Area is former orchards, and the western portion is undeveloped grassland. Historic aerial photographs show that the eastern portion of the Project Area was undeveloped land and has been utilized for agriculture from 1931 to 1962. In aerial photographs from 1962, a house and two structures are visible within the Project Area and the southern portion of the Project Area has been planted for orchards. From 1966 to 1967, the northeastern portion of the Project Area was also planted for orchards (NETROnline 2022; University of California, Santa Barbara [UCSB] Library 2022). Since 2018, the last year for which aerial photographs of the Project Area are available, the orchards and irrigation features have been removed and the ground surface is covered in a dense layer of wood chips. The western undeveloped portion of the Project Area has been disturbed by Off-Highway Vehicle (OHV) activity and modern dumping.

Surrounding parcels are utilized for residential, small-scale agricultural, and recreational purposes, with notable increases in residential development since the late 1970s. Some land still sits vacant. Investment in community-oriented projects is evident in the presence of Martin Luther King High School, John F. Kennedy Elementary School, and Orange Terrace Community Park to the east of the Project Area.

g. Vegetation

Vegetation within the Project Area consisted of low-lying invasive grasses in formal agricultural areas, and dense and tall vegetation along drainages and fence lines. Much of the property has undergone decades of extensive agricultural use. The Project Area contains non-native grassland characterized by Russian thistle and other non-native grasses and scrub.

h. Geology

Local geology can be characterized as cretaceous period plutonic rocks of peninsular ranges (qdi) composed of quartz diorite (Dibblee 2003). Surface sediments within the Project Area are mainly composed of sandy loam alfisols, entisols, and inceptisols resulting from granite-derived alluvium. Base landforms are characterized as alluvial fans and rocky outcrops. The majority of the Project Area contains three soil types: Fallbrook sandy loam coarse sandy loam with 8 to 15 percent slopes, Vista coarse sandy loam with 8 to 15 percent slopes, and Cieneba rocky sandy loam with 15 to 50 percent slopes. Other soil types that overlap the Project Area include Cieneba sandy loam, Bonsall fine sandy loam, and Handord coarse sandy loam (Soilweb 2022).

II PRECONTACT CONTEXT

a. Regional Prehistory

Paleo-Indian Period/Terminal Pleistocene (12,000 to 10,000 Before Present [BP])

The first inhabitants of southern California were big game hunters and gatherers exploiting extinct species of Pleistocene megafauna (e.g., mammoth and other Rancholabrean fauna). Local "fluted point" assemblages comprised of large spear points or knives are stylistically and technologically similar to the Clovis Paleo-Indian cultural tradition dated to this period elsewhere in North America (Moratto 1984). Archaeological evidence for this period in southern California is limited to a few small temporary camps with fluted points found around late Pleistocene lake margins in the Mojave Desert and around Tulare Lake in the southern San Joaquin Valley. Single points are reported from Ocotillo Wells and Cuyamaca Pass in eastern San Diego County and from the Yuha Desert in Imperial County (Rondeau et al. 2007).

Early Archaic Period/Early Holocene (10,000 to 8,500 BP)

Approximately 10,000 years ago, at the beginning of the Holocene, warming temperatures, and the extinction of the megafauna resulted in changing subsistence strategies with an emphasis on hunting smaller game and increasing reliance on plant gathering. Previously, Early Holocene sites were represented by only a few sites and isolates from the Lake Mojave and San Dieguito complexes found along former lakebeds and grasslands of the Mojave Desert and in inland San Diego County. More recently, southern California Early Holocene sites have been found along the Santa Barbara Channel (Erlandson 1994), in western Riverside County (Goldberg 2001; Grenda 1997), and along the San Diego County coast (Gallegos 1991; Koerper et al. 1991; Warren 1967).

The San Dieguito Complex was defined based on material found at the Harris site (CA-SDI-149) on the San Dieguito River near Lake Hodges in San Diego County. San Dieguito artifacts include large leaf-shaped points; leaf-shaped knives; large ovoid, domed, and rectangular end and side scrapers; engraving tools; and crescentics (Koerper et al. 1991). The San Dieguito Complex at the Harris site dates to 9,000 to 7,500 BP (Gallegos 1991). However, sites from this time period in coastal San Diego County have yielded artifacts and subsistence remains characteristic of the succeeding Encinitas Tradition, including manos, metates, core-cobble tools, and marine shell (Gallegos 1991; Koerper et al. 1991).

Encinitas Tradition or Milling Stone Period/Middle Holocene (8,500 to 1,250 BP)

The Encinitas Tradition (Warren 1968) and the Milling Stone Period (Wallace 1955) refer to a long period of time during which small mobile bands of people who spoke an early Hokan language foraged for a wide variety of resources including hard seeds, berries, and roots/tubers (yucca in inland areas), rabbits and other small animals, and shellfish and fish in coastal areas. Sites from the Encinitas Tradition consist of residential bases and resource acquisition locations with no evidence for overnight stays. Residential bases have hearths and fire-affected rock indicating overnight stays and food preparation. Residential bases along the coast have large amounts of shell and are often termed shell middens.

The Encinitas Tradition as originally defined (Warren 1968) applied to all of the non-desert areas of southern California. Recently, four patterns within the Encinitas Tradition have been proposed which apply to different regions of southern California (Sutton and Gardner 2010). The Topanga Pattern includes archaeological material from the Los Angeles Basin and Orange County. The Greven Knoll Pattern pertains to southwestern San Bernardino County and western Riverside County (Sutton and Gardner 2010). Each of the patterns is divided into temporal phases. The Topanga Pattern included the Los Angeles Basin and Orange County. The Topanga I phase extends from 8,500 to 5,000 BP and Topanga II runs from 5,000 to 3,500 BP. The Topanga Pattern ended about 3,500 BP with the arrival of Takic speakers, except in the Santa Monica Mountains where the Topanga III phase lasted until about 2,000 BP.

The Encinitas Tradition in inland areas east of the Topanga Pattern (southwestern San Bernardino County and western Riverside County) is the Greven Knoll Pattern (Sutton and Gardner 2010). Greven Knoll I (9,400-4,000 BP) has abundant manos and metates. Projectile points are few and are mostly Pinto points. Greven Knoll II (4,000-3,000 BP) has abundant manos and metates and core tools. Projectile points are mostly Elko points. The Elsinore site on the east shore of Lake Elsinore was occupied during Greven Knoll I and Greven Knoll II. During Greven Knoll I faunal processing (butchering) took place at the lakeshore and floral processing (seed grinding), cooking, and eating took place farther from the shore. The primary foods were rabbit meat and seeds from grasses, sage, and ragweed. A few deer, waterfowl, and reptiles were consumed. The recovered archaeological material suggests that a highly mobile population visited the site at a specific time each year. It is possible that their seasonal round included the ocean coast at other times of the year. These people had an unspecialized technology as exemplified by the numerous crescents, a multi-purpose tool. The few projectile points suggest that most of the small game was trapped using nets and snares (Grenda 1997:279). During Greven Knoll II, which included a warmer drier climatic episode known as the Altithermal, it is thought that populations in interior southern California concentrated at oases and that Lake Elsinore was one of them. The Elsinore site (CA-RIV-2798) is one of five known Middle Holocene residential sites around Lake Elsinore. Tools were mostly manos, metates, and hammerstones. Scraper planes were absent. Flaked-stone tools consisted mostly of utilized flakes used as scrapers. The Elsinore site during the Middle Holocene was a "recurrent extended encampment" which could have been occupied during much of the year.

The Encinitas Tradition lasted longer in inland areas because Takic speakers did not move east into these areas until circa 1,000 BP. Greven Knoll III (3,000-1,000 BP) is present at the Liberty Grove site in Cucamonga (Salls 1983) and at sites in Cajon Pass that were defined as part of the Sayles Complex (Kowta 1969). Greven Knoll III sites have a large proportion of manos and metates and core tools as well as

scraper planes. Kowta (1969) suggested the scraper planes may have been used to process yucca and agave. The faunal assemblage consists of large quantities of lagomorphs (rabbits and hares) and lesser quantities of deer, rodents, birds, carnivores, and reptiles.

Palomar Tradition (1,250 – 150 BP)

The native people of southern California (north of a line from Agua Hedionda to Lake Henshaw in San Diego County) spoke Takic languages which form a branch or subfamily of the Uto-Aztecan language family. The Takic languages are divided into the Gabrielino-Fernandeño language, the Serrano-Kitanemuk group (the Serrano [includes the Vanyume dialect] and Kitanemuk languages), the Tataviam language, and the Cupan group (the Luiseño-Juaneño language, the Cahuilla Language, and the Cupeño language) (Golla 2011). According to Sutton (2009), Takic speakers occupied the southern San Joaquin Valley before 3,500 BP. Perhaps as a result of the arrival of Yokutsan speakers (a language in the Penutian language family) from the north, Takic speakers moved southeast. The ancestors of the Kitanemuk moved into the Tehachapi Mountains and the ancestors of the Tataviam moved into the upper Santa Clara River drainage. The ancestors of the Gabrielino (Tongva) moved into the Los Angeles Basin about 3,500 BP, replacing the native Hokan speakers. Speakers of proto-Gabrielino reached the southern Channel Islands by 3,200 BP (Sutton 2009) and moved as far south as Aliso Creek in Orange County by 3,000 BP.

Takic people moved south into southern Orange County after 1,250 BP and became the ancestors of the Juaneño. Takic people moved inland from southern Orange County about 1,000 BP, becoming the ancestors of the Luiseño, Cupeño, and Cahuilla. Takic people from the Kitanemuk area moved east along the northern slopes of the San Gabriel Mountains and spread into the San Bernardino Mountains and along the Mojave River becoming the ancestors of the Serrano and the Vanyume.

The material culture of the inland areas where Takic languages were spoken at the time of Spanish contact is part of the Palomar Tradition (Sutton 2011). San Luis Rey I Phase (1,000 – 500 BP) and San Luis Rey II Phase (500 – 150 BP) pertain to the area occupied by the Luiseño at the time of Spanish contact. The Peninsular I (1,000 – 750 BP), II (750 – 300 BP), and III (300 – 150 BP) Phases are used in the areas occupied by the Cahuilla and Serrano (Sutton 2011).

San Luis Rey I is characterized by Cottonwood Triangular arrow points, use of bedrock mortars, stone pendants, shell beads, quartz crystals, and bone tools. San Luis Rey II sees the addition of ceramics, including ceramic cremation urns, red pictographs on boulders in village sites, and steatite arrow straighteners. San Luis Rey II represents the archaeological manifestation of the antecedents of the historically known Luiseño (Goldberg 2001). During San Luis Rey I there were a series of small permanent residential bases at water sources, each occupied by a kin group (probably a lineage). During San Luis Rey II people from several related residential bases moved into a large village located at the most reliable water source (Waugh 1986). Each village had a territory that included acorn harvesting camps at higher elevations. Villages have numerous bedrock mortars, large dense midden areas with a full range of flaked and ground stone tools, rock art, and a cemetery.

b. Summary of Known Archaeology in the Project Area

The 2015 and 2022 records search indicated that there are four previously recorded resources within or adjacent to the Project Area, consisting of four precontact milling feature sites. Based on the available literature, it appears that none of these sites have been tested for the presence of subsurface resources.

Over [redacted] previously recorded cultural resources are located within the vicinity of the Project Area. These consist of a mix of precontact and historic-period sites; however, the majority consist of precontact milling sites located within the nearby hillsides and nearby drainages around the Project Area.

c. Ethnohistory

The Project Area is located within the territory known to have been occupied by the Cahuilla group of Native Americans, and near territory occupied the Gabrielino and Luiseño groups of Native Americans, at the time of contact with Europeans, around A.D. 1769.

Cahuilla. Ethnographic accounts of Native Americans indicate that the Project Area lies predominantly within the original territory of the Cahuilla. The Cahuilla spoke a Takic language. The Takic group of languages is part of the Uto-Aztecan language family. The Cahuilla occupied a territory ranging from the San Bernardino Mountains in the north to the Chocolate Mountains and Borrego Springs in the south, and from the Colorado Desert in the east to Palomar Mountain in the west. They engaged in trade, marriage, shared rituals, and war with other groups of Native Americans whose territories they overlapped, primarily the Serrano and Gabrielino (Bean 1978, 1972; Kroeber 1925).

Cahuilla subsistence consisted of hunting, gathering, and fishing. Villages were often located near water sources, most commonly in canyons or near drainages on alluvial fans. Major villages were fully occupied during the winter, but during other seasons task groups made periodic forays to collect various plant foods, with larger groupings from several villages organizing for the annual acorn harvest (Bean and Saubel 1972). Bean and Saubel (1972) have recorded the use of several hundred species of plants used for food, building/artifact materials, and medicines. The major plant foods included acorns, pinyon nuts, and various seed-producing legumes. These were complemented by agave, wild fruits and berries, tubers, cactus bulbs, roots and greens, and seeds.

Hunting focused on both small to medium-sized mammals, such as rodents and rabbits, and large mammals, such as pronghorn sheep, mountain sheep, and mule deer. Hunting was done using the throwing stick or the bow and arrow, though nets and traps were also used for small animals (Bean 1972).

Cahuilla buildings consisted of dome-shaped or rectangular houses, constructed of poles covered with brush and above-ground granaries (Bean 1978; Strong 1929). Other material culture included baskets, pottery, and grinding implements; stone tools, arrow shaft straighteners and bows; clothing (loincloths, blankets, rope, sandals, skirts, and diapers); and various ceremonial objects made from mineral, plant, and animal substances (Bean 1972).

As many as 10,000 Cahuilla may have existed at the time of European contact in the eighteenth century (Bean 1978). Circa 1900, Cahuilla lived in the settlements of La Mesa, Toro, and Martinez on the Augustin

and Toro Indian Reservations east and southeast of the Project Area (USGS 1904). As of 1974, approximately 900 people claimed Cahuilla ancestry (Bean 1978).

There was no substantial Euro-American settlement in the Coachella Valley until the Southern Pacific Railroad completed its line from Los Angeles to Indio (then known as Indian Wells) in 1876. The railroad was completed to Yuma in 1877, linking southern California with Arizona and points east. Wells to supply water for the steam locomotives were dug at Indio, Coachella (originally named Woodspur), Thermal (originally named Kokell), and Mecca (originally named Walters). Settlement began around these wells and railroad stations, forming the nucleus of today's Coachella Valley towns.

Gabrieliño. Ethnographic accounts of Native Americans indicate that the Gabrieliño (also known as Gabrieleno, or Tongva) once occupied the region that encompasses the project area. At the time of contact with Europeans, the Gabrieliño were the main occupants of the southern Channel Islands, the Los Angeles Basin, much of Orange County, and extended as far east as the western San Bernardino Valley. The term "Gabrieliño" came from the group's association with Mission San Gabriel Arcángel, established in 1771. The Gabrieliño are believed to have been one of the most populous and wealthy Native American tribes in southern California prior to European contact. (Bean and Smith 1978a; McCawley 1996; Moratto 1984) and spoke a Takic language. The Takic group of languages is part of the Uto-Aztecan language family.

The Gabrieliño occupied villages located along rivers and at the mouths of canyons. Populations ranged from 50 to 200 inhabitants. Residential structures within the villages were domed, circular, and made from thatched tule or other available wood. Gabrieliño society was organized by kinship groups, with each group composed of several related families who together owned hunting and gathering territories. Settlement patterns varied according to the availability of floral and faunal resources (Bean and Smith 1978a; McCawley 1996; Miller 1991).

Vegetal staples consisted of acorns, chia, seeds, piñon nuts, sage, cacti, roots, and bulbs. Animals hunted included deer, antelope, coyote, rabbits, squirrels, rodents, birds, and snakes. The Gabrieliño also fished and collected marine shellfish (Bean and Smith 1978a; McCawley 1996; Miller 1991).

By the late 18th century, Gabrieliño population had significantly dwindled due to introduced European diseases and dietary deficiencies. Gabrieliño communities disintegrated as families were taken to the missions (Bean and Smith 1978a; McCawley 1996; Miller 1991). However, current descendants of the Gabrieliño are preserving Gabrieliño culture.

Luiseño. The Luiseño are a Takic-speaking people who occupied what is now western Riverside County and northern San Diego County (the San Luis Rey River drainage) in prehistoric and historic times. The term Luiseño was given by the Spanish to the native groups who were living in this area and who were forcibly removed to Mission San Luis Rey. The Luiseño believe the world was created in the area now known as Temecula and that they have been here since the beginning of time.

The Luiseño lived in sedentary and autonomous village groups, each with specific subsistence territories encompassing hunting, collecting, and fishing areas. Villages were typically located in valley bottoms, along streams, or along coastal strands near mountain ranges where water was available and village

defense was possible. Inland populations had access to fishing and gathering sites on the coast, which they used during the winter months (Bean and Shipek 1978).

Luiseño subsistence was centered around the gathering of acorns, seeds, greens, bulbs, roots, berries, and other vegetal foods. This was supplemented with hunting mammals such as deer, antelope, rabbit, woodrat, ground squirrels, and mice, as well as quail, doves, ducks, and other birds. Bands along the coast also exploited marine resources, such as sea mammals, fish, crustaceans, and mollusks. Inland, trout and other fish were taken from mountain streams (Bean and Shipek 1978).

Hunting was carried out both individually and by organized groups. Tool technology for food acquisition, storage, and preparation reflects the size and quantity of items procured. Small game was hunted with the use of curved throwing sticks, nets, slings, or traps. Bows and arrows were used for hunting larger game. Dugout canoes, basketry fish traps, and shell hooks were used for near-shore ocean fishing. Coiled and twined baskets were made for food gathering, preparation, storing, and serving. Other items used for food processing included large shallow trays for winnowing chaff from grain, ceramic and basketry storage containers, manos and metates for grinding seeds, and ceramic jars for cooking (Bean and Shipek 1978).

Villages had hereditary chiefs who controlled religious, economic, and territorial activities (Bean and Shipek 1978; Boscana 1933). An advisory council of ritual specialists and shamans was consulted for environmental and other knowledge. large villages located along the coast or in inland valleys may have had more complex social and political structures than settlements controlling smaller territories (Bean and Shipek 1978; Strong 1929).

Most Luiseño villages contained a ceremonial structure, enclosed by circular fencing and located near the center of the village. Houses were semisubterranean and thatched with locally available brush, bark, or reeds. Earth-covered semisubterranean sweathouses were also common and were used for purification and curing rituals (Bean and Shipek 1978).

The Luiseño first came into contact with Europeans in 1769 when the expedition led by Gaspar de Portolá arrived in their territory. That same year, the San Diego Mission was established just to the south, followed by the San Juan Capistrano Mission in 1776 and the San Luis Rey Mission in 1798. Poor living conditions at the missions and introduced European diseases led to a rapid decline of the Luiseño population. Following the Mission Period (1769-1834), Luiseño Indians scattered throughout southern California. Some became serfs on the Mexican ranchos, others moved to newly founded pueblos established for them, some sought refuge among inland groups, and a few managed to acquire land grants. Later, many moved to or were forced onto reservations. Although many of their cultural traditions had been suppressed during the Mission Period, the Luiseño were successful at retaining their language and certain rituals and ceremonies. Starting in the 1970s, there was a revival of interest in the Luiseño language and classes were organized. Since then, traditional games, songs, and dances have been performed, traditional foods have been gathered and prepared, and traditional medicines and curing procedures have been practiced (Bean and Shipek 1978).

III HISTORIC CONTEXT

a. Historic Periods

Early Southern California History

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978). Vizcaíno also named San Diego Bay to commemorate Saint Didacus. The name began to appear on European maps of the New World by 1624 (Gudde 1998:332).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterrey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and towns were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. Mission San Diego was established to convert the Native Americans that lived in the area, known as the Kumeyaay or Diegueño. Mission San Gabriel Archangel was founded in 1771 east of what is now Los Angeles to convert the Tongva or Gabrieliño. Mission San Fernando, also in Tongva/Gabrieliño territory, was established in 1797. Mission San Juan Capistrano was established in 1776 on San Juan Creek (in what is now southern Orange County) to convert the Agjachemem or Juaneño. Mission San Luis Rey was established in 1798 on the San Luis Rey River (in what is now northern San Diego County) to convert the Luiseño. Missions San Buenaventura and Santa Barbara were founded in Chumash territory in 1782 and 1786, respectively (Castillo 1978:100).

Some missions later established outposts in inland areas. An asistencia (mission outpost) of Mission San Luis Rey, known as San Antonio de Pala, was built in Luiseño territory along the upper San Luis Rey River near Mount Palomar in 1810 (Pourade 1961). A chapel administered by Mission San Gabriel Archangel was established in the San Bernardino area in 1819 (Bean and Smith 1978b). The present asistencia within the western outskirts of present-day Redlands was built circa 1830 (Haenszel and Reynolds 1975). The missions sustained themselves through cattle ranching and traded hides and tallow for supplies brought by ship. Large cattle ranches were established by Mission San Luis Rey at Temecula and San Jacinto (Gunther 1984). The Spanish also constructed presidios, or forts, at San Diego and Santa Barbara, and a pueblo, or town, was established at Los Angeles. The Spanish period in California began in 1769 with the Portola expedition and ended in 1821 with Mexican independence.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California. The Mexican government closed the missions in the 1830s and former mission lands were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the

land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Diego (near the presidio), San Juan Capistrano (around the mission), and Los Angeles. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries which were surveyed by the U.S. Surveyor General's office. Land that was not part of a land grant was owned by the U.S. government until it was acquired by individuals through purchase or homesteading. Floods and drought in the 1860s greatly reduced the cattle herds on the ranchos, making it difficult to pay the new American taxes on the thousands of acres they owned. Many Mexican-American cattle ranchers borrowed money at usurious rates from newly arrived Anglo-Americans. The resulting foreclosures and land sales transferred most of the land grants into the hands of Anglo-Americans (Cleland 1941:137-138).

Woodcrest History

Woodcrest is a census designated place in Riverside County. Although its name comes from Woodcrest Acres, a subdivision constructed in 1924, people have claimed it is attributed to the people with variations of the surname Wood who were involved in the early history of the area. One such person was John C. Woodard, an Ohio native, who built a homestead in Woodcrest in 1884. Woodard later became a trustee of the school board and ran for county treasurer in 1894.

As no roads were constructed in the area, Woodard built Woodard's Grade, a wagon road, which ran from modern day Golden Star Avenue, south to Washington Street. The alignment of the road was used until 1959 when the County realigned the road.

Another contribution to the Woodcrest name was from Wood Road built in 1916. The road was named as such as it crossed through property owned by Susan Wood.

In 1926, the Woodcrest Post Office was established. The Woodcrest name was then used for four additional subdivisions in the area. During the 1950's, the Western Municipal Water District was formed, and included Woodcrest which soon led to the planting of orange groves throughout the community (Johnson 2020).

b. Historic-Period Native American Settlement

The immediate Project Area does not retain documentation of any protohistoric villages; however, the presence of many bedrock milling features in the area is testament to the history of food processing and habitation activity in the area. The intensive ownership of land by Euro-Americans from the Spanish Period through the Mexican Period to the American Period reduced the footprint of many Native American villages in historic times.

c. Land Granting and Modern Use of the Area

Rancho San Jacinto was first granted to José Antonio Estudillo in 1842, subsequently being split in half three years later with Estudillo's son forming Rancho San Jacinto Nuevo y Potrero and his daughter forming El Sobrante de San Jacinto (Haggland 1983). Private lands gradually shrank during the latter half of the nineteenth century and the early twentieth century due to increased railroad and economic activity and the sale of land for new settlements and homesteads. Agriculture remained a staple of the region with periodic downturns due to variability in access to water. The earliest available aerial photos of the Project Area date to 1931 (UCSB Library 2022). Aerial photographs from the 1930s through 2018 present show that the eastern portion of the Project Area was used for agriculture from the early 1963 to the present. A house and two associated structures are fist visible in aerial photographs from 1963 (NETROnline 2022; UCSB Library 2022). Roads have existed for some time around portions of the perimeter of the Project Area, and the increase in residential and commercial development in the region can be seen through time to the present day.

IV RESEARCH DESIGN

a. Legal Compliance Basis

This updated Phase 1 study was carried out in accordance with the requirements of the County of Riverside and under a Memorandum of Agreement with the County to support future environmental review under the California Environmental Quality Act (CEQA). CEQA is the state law that applies to a project's impacts on cultural resources. A project is an activity that may cause a direct or indirect physical change in the environment and that is undertaken or funded by a state or local agency, or requires a permit, license, or lease from a state or local agency. CEQA requires that impacts to Historical Resources be identified and, if the impacts will be significant, then apply mitigation measures to reduce the impacts. A Historical Resource is a resource that:

1) is listed in or has been determined eligible for listing in the California Register of Historical Resources (CRHR) by the State Historical Resources Commission, or has been determined historically significant by the CEQA lead agency because it meets the eligibility criteria for the CRHR,

2) is included in a local register of historical resources, as defined in Public Resources Code (PRC) 5020.1(k), or

3) has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g) (California Code of Regulations [CCR] Title 14, Section 15064.5(a)).

The eligibility criteria for the CRHR are as follows (CCR Title 14, Section 4852(b)):

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
(2) It is associated with the lives of persons important to local, California, or national history;
(3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or

(4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity, which is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, Section 4852(c)). Resources that have been determined eligible for the NRHP are automatically eligible for the CRHR.

Impacts to a Historical Resource, as defined by CEQA (listed in an official historic inventory or survey or eligible for the CRHR), are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, Section 15064.5(b)). Demolition or alteration of eligible buildings, structures, and features that they would no longer be eligible would result in a significant impact. Whole or partial destruction of eligible archaeological sites would result in a significant impact. In addition to impacts from construction resulting in destruction or physical alteration of an eligible resource, impacts to the integrity of setting (sometimes termed visual impacts) of physical features in the Project Area could also result in significant impacts.

Tribal Cultural Resources (TCRs) are defined in Section 21074 of the California PRC as sites, features, places, cultural landscapes (geographically defined in terms of the size and scope), sacred places, and objects with cultural value to a California Native American tribe that are either included in or determined to be eligible for inclusion in the CRHR, or are included in a local register of historical resources as defined in subdivision (k) of Section 5020.1, or are 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 Section 5024.1. Section 1(b)(4) of Assembly Bill (AB) 52 established that only California Native American tribes, as defined in Section 21073 of the California PRC, are experts in the identification of TCRs and impacts thereto. Because ECORP does not meet the definition of a California Native American tribe, it only addresses information in this report for which it is qualified to identify and evaluate, and that which is needed to inform the cultural resources section of CEQA documents. This report, therefore, does not identify or evaluate TCRs. Should California Native American tribes ascribe additional importance to or interpretation of archaeological resources described herein, or provide information about non-archeological TCRs, that information is documented separately in the AB 52 tribal consultation record between the tribe(s) and lead agency and summarized in the TCRs section of the CEQA document, if applicable.

In addition, in the event that the Project would affect Waters of the U.S., thereby requiring the Project proponent to meet the requirements of Section 404 of the Clean Water Act and obtain a permit from the U.S. Army Corps of Engineers' (USACE), this report was prepared to contribute to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. Section 106 of the NHPA requires that federal agencies take into account the effects of a federal undertaking on properties listed in or eligible for the NRHP. The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is defined in 36 CFR 800.16(y):

A federal undertaking means "a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a federal agency, including those carried out by or on behalf of a federal agency;

those carried out with Federal financial assistance; and those requiring a federal permit, license, or approval."

The federal agency must seek comment from the State Historic Preservation Officer (SHPO) and, in some cases, the ACHP, for its determinations of eligibility, effects, and proposed mitigation measures. Section 106 procedures for a specific project can be modified by negotiation of a Memorandum of Agreement or Programmatic Agreement between the federal agency, the SHPO, and, in some cases, the project proponent.

Effects to a cultural resource are potentially adverse if the lead federal agency, with the SHPO's concurrence, determines the resource eligible for the NRHP, making it a Historic Property, and if application of the Criteria of Adverse Effects (36 CFR 800.5[a][2] et seq.) results in the conclusion that the effects will be adverse. The NRHP eligibility criteria, contained in 36 CFR 63, are as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and

(A) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
(B) is associated with the lives of persons important in our past;
(C) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
(D) has yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, barring exceptional circumstances (36 CFR 60.4). Resources that are eligible for, or listed on, the NRHP are historic properties.

Regulations implementing Section 106 of the NHPA (36 CFR 800.5) require that the federal agency, in consultation with the SHPO, apply the Criteria of Adverse Effect to historic properties within the APE. According to 36 CFR 800.5(a)(1):

"An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling or association."

b. Research Framework

The California OHP requires the use of a research design that "should present important research questions recognized for the region and relevant to the study, based on previous research" (OHP 1989:9). Research questions serve to guide research methods and to assess the potential for the recovery of scientifically valid data that are likely to satisfy NRHP Criterion D or CRHR Criterion 4, the ability of the resource to produce information important in prehistory or history.

As described in the records search results below, there are pre-contact sites in the APE. The principal activity at these sites was food processing and general subsistence activities. Research topics for the pre-contact sites in the Project APE include activities and site function, internal site organization, subsistence patterns, and chronology and temporal patterning.

Activities and Site Function: What activities other than acorn processing, if any, took place at the sites? Is there a full range of activities represented such as would be characteristic of a habitation site or only a limited set of activities? Is there evidence for lithic tool production and what techniques were used? Did techniques change over time? Data requirements to address these questions include tools classified functionally and debitage classified technologically. If subsurface features (hearths, ovens) are present, the type and number of features will also help address these questions.

Internal Site Organization: Are there distinct manufacturing, processing, or food preparation areas within the sites? Were male and female activities carried out in different areas of a site? Are distinct activity areas associated with each outcrop containing bedrock mortars or was a single activity area used by everyone using any of the bedrock mortars at the site? Data requirements include maps of the spatial distribution of tools, debitage, subsistence remains, and features. If the site is small and there are few categories that do not vary spatially, this domain cannot be addressed.

Subsistence Patterns: What resources were brought to the sites, prepared, and consumed? Is there evidence for specialization or intensification of resource use? Specialization would be indicated by large numbers of the remains of a single species. Intensification would be indicated by reliance on resources that require greater amounts of labor to procure or process. To address questions about subsistence, a reliable sample of plant or animal subsistence remains would be necessary.

Chronology and Temporal Patterning: Were the sites used at the same time as other nearby sites or sequentially? Were the sites used continuously for a short or long period of time? Were there periods of time when the sites were not used (continuous occupation or periodic abandonment)? Data requirements include sufficient charcoal for radiocarbon dating and/or time sensitive artifacts, such as beads.

V METHODS

a. Records Search Methods

FCS first conducted a records search of 0.5-mile radius from the Project Area on March 10, 2015, as part of the original 2015 Phase I study. The results of the 2015 records search results are summarized below and may also be found in the 2015 report, attached as Confidential Appendix A. In December 2021, ECORP requested a new records search of the CHRIS from the Eastern Information Center (EIC), University of California, Riverside. The EIC is the official repository of cultural resources reports and site records for Riverside County. The purpose of the updated records search was to determine the extent and location of any additional surveys, precontact or historic archaeological site locations, architectural resources, historic properties, cultural landscapes, or ethnic resources that have been recorded since the FCS 2015 Phase I study, and to expand the records search radius out to current standard of 1 mile. Materials reviewed included survey and evaluation reports, archaeological site records, historic maps, and listings of resources on the NRHP, CRHR, California Points of Historical Interest, California Historical Landmarks, and

National Historic Landmarks. Historic-period aerial photographs and Bureau of Land Management Government Land Office records were also reviewed as a part of this study. Results of the CHRIS records search are included in Confidential Appendix D.

FCS requested a search of the Sacred Lands File by the Native American Heritage Commission (NAHC) on March 5, 2015, as part of the 2015 Phase I study. The results of the 2015 records search results are summarized below in Section V.b. NAHC Sacred Lands File Search Results and may also be found in the 2015 report, attached as Confidential Appendix A. ECORP requested an updated search of the Sacred Lands File by the NAHC in December 2021. This updated search was requested to determine whether any sensitive or sacred Native American resources in the vicinity of the Project Area that could be affected by the proposed Project. The NAHC was also asked to provide a list of Native American groups that have historic or traditional ties to the Project Area. A copy of correspondence with the NAHC is provided as Appendix E.

On March 15, 2022, ECORP mailed notification letters to the following tribes, inviting them to participate in the fieldwork: Agua Caliente Band of Cahuilla Indians, Augustine Band of Cahuilla Mission Indians, Cabazon Band of Mission Indians, Cahuilla Band of Indians, Los Coyotes Band of Cahuilla and Cupeno Indians, Morongo Band of Mission Indians, Pala Band of Mission Indians, Pechanga Band of Luiseño Indians, Quechan Tribe of the Fort Yuma Reservations, Ramona Band of Cahuilla, Rincon Band of Luiseño Indians, Santa Rosa Band of Cahuilla Indians, Soboba Band of Luiseño Indians, and Torres-Martinez Desert Cahuilla Indians. Copies of the notification letters are provided in Appendix F.

b. Field Survey Methods

FCS conducted a formal survey of the majority of the Project Area in 2015. FCS Archaeologists Coral A. Eginton, M.A., RPA; Tim Garfin, B.A.; and Sydni Kitchel, B.A. surveyed the APE on March 26, March 27, and April 21, 2015. At the time, the APE consisted of 140 acres of existing orange groves, a single-family residence, and undeveloped rural land. The methods are detailed in the 2015 report that is attached as Confidential Appendix A.

In 2022, ECORP carried out additional fieldwork. Because the orange groves reported by FCS in 2015 were no longer visible on aerial photographs, archaeologists Robert Cunningham and Julian Acuña, RPA conducted an initial field visit to the Project Area on February 17, 2022. The purpose of this visit was to confirm the changes in field conditions since the FCS 2015 Phase I study and to attempt to locate all four previously recorded resources within the Project Area. As described further below, FCS had been unable to locate two of the previously recorded sites in 2015. ECORP archaeologists did not conduct a formal survey over the original 140-acre Project Area or identify or record archaeological resources during this visit.

Subsequently, ECORP was notified of the fact that an adjacent 20-acre property, referred to as the Gless Property, was included in the currently proposed project area, but that it had not been surveyed by FCS in 2015. Therefore, a second cultural resources pedestrian survey was required. ECORP archaeologists Robert Cunningham and Julian Acuña, RPA, accompanied by tribal monitor Edward Ortiz from Pechanga, conducted an intensive pedestrian survey of the additional 20 acres Project Area on March 31, 2022.

During this pedestrian survey, which used transect intervals of 10 to 15 meters, the ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by such factors as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits. No subsurface investigations or artifact collections were undertaken during the pedestrian survey.

On the following day, April 1, 2022, archaeologists Robert Cunningham and Julian Acuña, RPA returned to the 140-acre portion of the Project Area only to collect submeter GPS boundaries of the four previously recorded resources within the Project Area so that all resources (previously recorded and newly identified) were mapped with the same level of precision and accuracy. This was also necessary because the EIC would not provide maps showing the locations, other than what was contained in the original DPR records.

All cultural resources encountered during the survey were recorded using Department of Parks and Recreation (DPR) 523-series forms approved by the California Office of Historic Preservation. The resources were photographed, mapped using a handheld Global Positioning System receiver, and sketched as necessary to document their presence using appropriate DPR forms.

VI RESULTS

a. Records Search Results

FCS conducted a records search as part of the 2015 Phase I study. The results of the 2015 records search indicated that 16 cultural resource investigations have been conducted within a 0.5-mile radius of the Project Area between 1978 and 2012. Of these studies, one of these studies overlapped a majority of the Project Area. The results of the 2015 study also revealed the presence of [redacted] previously recorded historic-period and precontact resources within a 0.5-mile radius of the Project Area.

ECORP requested an updated records search in December 2021, expanding the records search radius out to the current standard of 1 mile from the Project Area. ECORP received the results from the EIC on February 14, 2022. The records search update results provided details for an additional 43 cultural resource investigations and [redacted] additional cultural resources. Due to the current COVID-19 pandemic and the effect it has had on staffing levels at Information Centers, including the EIC, maps depicting the locations of additional resources and reports not included in the FCS 2015 records search were not provided. All specific locations stated within the current report are based on the initial 2015 study. Results of the CHRIS records search are included in Confidential Appendix D.

A review of the FCS 2015 records search determined four of the listed 16 cultural resource investigations were not conducted within a 0.5-mile radius and therefore removed from the results. Incorporating the revised results of the FCS 2015 records search into the results of the 2022 records search update indicates that a total of 55 cultural resource investigations have been conducted within 1 mile of the Project Area between 1974 and 2016. Details of all 55 investigations are presented below in Table 1. The records search

indicated that approximately 95 percent of the Project Area had been previously surveyed for cultural resources.

Table 1. Previous Cultural Studies in or within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-00433	N. Nelson Leonard, III	Letter Report: Review of Tracts 11044, 11045, 11046, and 11047	1978	No
RI-00783	Larry L. Bowles and Jean A. Salpas	An Archaeological Assessment of Parcel 16191	1980	No
RI-00792	Larry L. Bowles and Jean A. Salpas	An Archaeological Assessment of Parcel 16190	1980	No
RI-00808	Jean A. Salpas	An Archaeological Assessment of Parcel 16998	1980	No
RI-00809	Larry L. Bowles and Jean A. Salpas	An Archaeological Assessment of Parcel 15033	1980	No
RI-01114	Larry L. Bowles	An Archaeological Assessment for Tentative Parcel 17219	1981	No
RI-01144	D.M Van Horn	Archaeological Survey Report: The 1500 Acre Woodcrest Agricultural Preserve Located Adjacent to March AFB, Riverside County, California	1980	No
RI-01254	Alan Davis	Environmental Impact Evaluation: An Archaeological Assessment of Tentative Parcel 17435, Northeast of Woodcrest in Riverside County, California	1981	No
RI-01406	Larry L. Bowles	An Archaeological Assessment for Tentative Parcel 18415	1982	No
RI-01582	Larry L. Bowles	Archaeological Assessment of Parcel 11605, Riverside County, California	1978	No
RI-01583	Larry L. Bowles	Archaeological Assessment of Parcel 11604, Riverside County, California	1978	No
RI-01584	Larry L. Bowles	Archaeological Assessment of Parcel 11763, Riverside County, California	1978	Yes
RI-01648	Archaeological Research, Inc.	Archaeological Report – Project W.O. 5-3764, Box Springs Feeder	1974	No
RI-01649	Michael K. Lerch	Cultural resources Assessment of the Santa Ana Watershed Project Authority Proposed Imported Water Conveyance System, Riverside County, California	1983	No
RI-01695	Jean A. Salpas	An Archaeological Assessment of Parcel 19188	1983	No

Table 1. Previous Cultural Studies in or within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-01726	Jean A. Salpas	An Archaeological Assessment of Parcel 19173	1983	No
RI-01889	Jean A. Salpas	An Archaeological Assessment of Parcel 20093	1984	No
RI-02224	Daniel F. McCarthy	An Archaeological Assessment of Parcel 1 of Parcel Map 12069 Located in the Woodcrest Area of Riverside County, California	1988	No
RI-02391	Robert E. Parr and P.J. Wilke	Cultural resources Assessment of the Alessandro Heights Project Located in the City of Riverside, Riverside County, California	1989	No
RI-02393	Bruce Love, Darcy Wiewall and Eugene Heck	Historical/Archaeological Resources Report: Executive Home Builders, City of Riverside, Riverside County, California	1999	No
RI-02461	Jean S. Keller	An Archaeological Assessment of TTM 24024, Riverside County, California	1989	No
RI-02464	C.E. Drover	An Archaeological Assessment of TT Map 23804, Riverside, California	1988	No
RI-02645	Christopher E. Drover	An Archaeological Assessment of the Lurin Roosevelt and Hillside Tank Sites Western Municipal Water District Riverside County, California	1990	No
RI-02810	Christopher E. Drover	An Archaeological Assessment of Parcel # 274-210-013 and 266-070-002, Woodside, Riverside County, California	1990	No
RI-02979	Christopher Drover	Environmental Impact Evaluation: Archaeological Assessment of General Plan Amendment 277 Woodcrest, Riverside County, California	1990	No
RI-03465	Christopher Drover	A Cultural Resources Assessment of the 800-Acre Alta Cresta Ranch Specific Plan, Riverside East - Steele Peak USGS Quads, Woodcrest CA	1992	No
RI-04373	Curt Duke	Cultural Resource Assessment for Modifications to Pacific Bell Wireless Facility CM 348-03, County of Riverside, California	2000	No
RI-04389	Antonina Delu and Robert Reynolds	Cultural Resources Assessment for Kross, Bert, and Dauchy Roads in the Woodcrest Area of Riverside County, California	2000	No

Table 1. Previous Cultural Studies in or within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-04690	Patrick Maxon	Results of a Pre-Development Cultural Resources Inventory and Biological Survey/Constraints Analysis for the 2.2 Acre Lincoln Self Storage Property, City of Riverside, Riverside County, California	2002	No
RI-04858	Leslie Irish	An Archaeological Assessment of the Orangecrest Hills Specific Plan Amendment Area, a 520 Acre Project Located in the Community of Orangecrest, Riverside County	1991	No
RI-05169	Roger D. Mason	Phase I Archaeological Survey Report for the Chen Ta Project, Riverside County, California	2004	No
RI-05180	Roger D. Mason	Phase I Cultural Archaeological Survey Report for the Chen Ta North Project, Riverside County, California	2005	No
RI-05377	Bruce Love and Mariam Dahdul	Archaeological Testing at Sites CA-RIV-4739, -4740, -4741, and -4743	2001	No
RI-05565	James J. Schmidt	Pole Relocation Corridor for the Hawarden Development Along Cactus Avenue, West of Harrington Road, Riverside County, CA	2002	No
RI-05994	Mariam Dahdul, Daniel Ballester, and Josh Smallwood	Archaeological Testing at Sites CA-RIV-4736/H, Alta Cresta Specific Plan, Tentative Tract Map No.s 31237, 31238, 31360 TO 31362, Neat the City of Riverside, Riverside County	2003	No
RI-06268	Sara Bholat and Evelyn Chandler	Cultural resources Investigation of the 5.4-Acre Property Located South of Van Buren Boulevard, City and County of Riverside, California	2006	No
RI-06427	Bai Tang, Michael Hogan, Matthew Wetherbee, and John Eddy	Historical/Archaeological Resource Survey Report, Tentative Parcel Map No. 32443, in an Unincorporated Area Near the City of Riverside, Riverside County, CA	2004	No
RI-06951	Koral Ahmet and Cary Cotterman	Cultural Resources Evaluation of Prehistoric and Historic-Period Resources on a 5.4 Acre Property Located South of van Buren Boulevard, City and County of Riverside, California	2007	No
RI-07236	Rod McLean	Cultural Resource Assessment for Cingular Wireless Facility No. SB-307-01 in Riverside County, California	2004	No

Table 1. Previous Cultural Studies in or within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-07277	Robert S. White, Laura S. White, and David Van Horn	A Cultural Resources Assessment of A 4.71-Acre Parcel as Shown on TPM 33749 Situated West of the Intersection of Gardener Avenue and Littlestone Lane, Woodcrest, Unincorporated Riverside County	2006	No
RI-07500	Bonner, Wayne H. and Marnie Aislin-Kay	Letter Report: Cultural Resource Records Search Results and Site Visit for Royal Street Communications, LLC Facility Candidate LA2364A (SBC/ATT Woodcrest), 16991 Van Buren Boulevard, Riverside, Riverside County, California	2007	No
RI-07547	Nora Collins and Brian F. Smith	An Archaeological Survey for the Mission Ranch/Gamble Lift Station Project	2006	No
RI-07909	Pierson, Larry J.	A Cultural Resources Survey of the Cochran Lot Split Project, County of Riverside, California, TPM #31916	2004	No
RI-08131	Wayne H. Bonner	Letter Report: Cultural Resources Record Search and Sote Visit Results for Royal Street Communications California, LLC Candidate LA2364B (Woodcrest Plaza), 17130-17086 Van Buren Boulevard, Riverside, Riverside County, California	2008	No
RI-08148	Michael Dice and Charles Bouscaren	Archaeological Testing Evaluation of the Woodcrest Project (APN 245-300-001), A Proposed Subdivision Located Near Chicago and Iris Avenues, County of Riverside, California	2004	Yes
RI-08740	Bai Tom Tang, Michael Hogan, Terri Jacquemain, and Daniel Ballester	Historical/Archaeological Resources Survey Report APNs 274-120-012, -017, -030, and 274-140-036	2013	No
RI-09489	Kristina Lindgren and Roger D. Mason	Cultural Resources Survey of a 1.44-Acre Property Located in the City and County of Riverside, California	2015	No
RI-09523	Andrew R. Pigniolo	Cultural Resources Survey Report For the 910 Highridge Street Project Riverside, California (APN 272-190-010-00)	2015	No
RI-09818	Hannah Hass, Breana Campbell, and Robert Ramirez	AFG Development LLC City Project Phase I Cultural Resources Study	2015	No

Table 1. Previous Cultural Studies in or within 1 Mile of the Project Area

Report Number	Author(s)	Report Title	Year	Includes Portion of the Project Area?
RI-09825	Robert Ramirez, Hannah Hass, and Breana Campbell	Phase I Cultural Resources Assessment for the Residential Subdivision - TM 36763 Project, Riverside County, California	2015	No
RI-09900	Tracy A. Stropes and Brian F. Smith	Cultural Resource Report for the TR37177 Project, City of Riverside, Riverside County, California	2016	No
RI-10068	Jennifer Roland	Phase I Investigation for the Crown Castle SB307 PBRE - Van Buren Antenna Installation Project, Riverside, Riverside County, California	2016	No
RI-10394	Brian F. Smith	A Cultural Resources Assessment for TR 37177 City of Riverside County, California	2018	No
RI-10542	Andrew J. Garrison, Jennifer R.K. Stropes, and Brian F. Smith	Cultural Resource Report for the 18806 Van Buren Boulevard Project, City of Riverside, Riverside County, California	2018	No
RI-10776	Andrew Garrison and Brian F. Smith	A Cultural Resources Assessment for TR 37177, City of Riverside, Riverside County, California	2018	No

A review of the FCS 2015 records search determined one resource has been demolished and is no longer a listed cultural resource, with another resource not located within their 0.5-mile radius. Therefore, both resources were removed from the results. Incorporating the revised results of the FCS 2015 records search into the results of the 2022 records search update indicates that a total of [redacted] cultural resources have been recorded within 1 mile of the Project Area. A total of [redacted] cultural resources have been recorded within or adjacent to the Project Area. [redacted]. In addition, [redacted] previously recorded cultural resources are located within 1 mile of the Project Area (Table 2). Of these [redacted] previously recorded resources, [redacted] are located within 0.5 mile of the Project Area, and [redacted] are located within 0.25 mile of the Project Area. Documented resources are a mix of precontact and historic-period sites, with the majority of sites being precontact resources. In total, previously recorded precontact sites include [redacted]. In total, historic-period sites include 11 building/residence resources, three homesteads, three refuse deposits, and one utility pole/powerline segment.

The presence of more than [redacted] supports a pattern of precontact land use centered on the processing of local plant materials. Details of previously recorded resources within the records search radius are provided in Table 2.

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
000112	000112	1979 (Larry Bowles and Charles L. Moser, Riverside Museum); 1982 (M. K. Lerch, G. A. Smith, San Bernardino County Museum Society); 1982 (L.L. Bowles, n/a)	Precontact	[redacted]	No
000853	000853	1982 (L.L. Bowles, n/a); 1989 (R.E. Parr, J. Goodman, R. Yohe, D. Everson, ARU, UCR); 2015 (H. Haas and B. Campbell, n/a)	Precontact	[redacted]	No
000899	000899	1982 (L.L. Bowles, n/a); 1989 (R.E. Parr, R. Yohe, B. Arkush, D. Everson, Archaeological Research Unit); 2015 (H. Haas and B. Campbell, n/a)	Precontact	[redacted]	No
002060	002060	1980 (Salpas and Bowles, n/a)	Precontact	[redacted]	No
002061	002061	1980 (Salpas and Bowles, n/a)	Precontact	[redacted]	No
002062	002062	1980 (Salpas and Bowles, n/a)	Precontact	[redacted]	No
002079	002079	1981 (L.L. Bowles, n/a)	Precontact	[redacted]	No
002080	002080	1981 (L.L. Bowles, n/a)	Precontact	[redacted]	No
002184	002184	1981 (Alan Davis, n/a)	Precontact	[redacted]	No
002554	002554	1982 (M.K. Lerch, San Bernardino County Museum Association, Redlands, CA.); 1988 (C.E. Drover); 1989 (R.E. Parr and D. Everson, Archaeological Research Unit, UC Riverside, Riverside, CA.)	Precontact	[redacted]	No
002555	002555	1982 (M.K. Lerch, San Bernardino County Museum Association, Redlands, CA.)	Precontact	[redacted]	No
002556	002556	1982 (M.K. Lerch, San Bernardino County Museum Association, Redlands, CA.); 1988 (C.E. Drover)	Precontact	[redacted]	No
002557	002557	1982 (M.K. Lerch, San Bernardino County Museum Association, Redlands, CA.); 1989 (R.E. Parr, B. Arkbush, D. Everson and J. Lehman, Archaeological Research Unit, UC Riverside, Riverside, CA.)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
002558	002558	1982 (M.K. Lerch, San Bernardino RI-01649; County Museum Association, Redlands, CA.)	Precontact	[redacted]	No
002559	002559	1982 (M.K. Lerch, San Bernardino County Museum Association, Redlands, CA.)	Precontact	[redacted]	No
002669	002669	1983 (Jean A. Salpas, n/a)	Precontact	[redacted]	No
002670	002670	1983 (Jean A. Salpas, n/a)	Precontact	[redacted]	No
002671	002671	1983 (Jean A. Salpas, n/a)	Precontact	[redacted]	No
002672	002672	1983 (Jean A. Salpas, n/a)	Precontact	[redacted]	No
003484	003484	1988 (C.E. Drover); 1989 (J. Goodman, K. Swope, J. Kent and D. Leavens, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003485	003485	1988 (C.E. Drover); 1989 (J. Goodman, K. Swope, J. Kent, G. Alcock and D. Leavens, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003486	003486	1988 (C.E. Drover); 1989 (J. Goodman, K. Swope, J. Kent, G. Alcock and D. Leavens, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003487	003487	1988 (C.E. Drover); 1989 (R. Parr, J. Goodman, K. Swope and J. Kent, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003488	003488	1988 (C.E. Drover); 1989 (J. Goodman, K. Swope and J. Kent, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003489	003489	1988 (C.E. Drover); 1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003490	003490	1988 (C.E. Drover); 1989 (R.E. Parr and J. Torres, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
003491	003491	1001 (Victor C. de Munck Archaeological & Ethnographic Field Associates, Riverside, CA.)	Precontact	[redacted]	No
003556	003556	1989 (R. Parr and M. Hogan, RI-02391 Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003580	003580	1989 (J. Goodman and L. Weingartner, Archaeological Research Unit, UC Riverside, CA.); 2018 (C. ACCARDY)	Precontact	[redacted]	No
003581	003581	1989 (R. Parr, J. Goodman, J. Torres, D. Leavens and L. Weingartner, Archaeological Research Unit, UC Riverside, CA.); 2018 (C. ACCARDY)	Precontact	[redacted]	No
003582	003582	1989 (J. Goodman and L. Weingartner, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003583	003583	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003584	003584	1989 (J. Goodman and L. Weingartner, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003585	003585	1989 (J. Goodman and L. RI-02391 Weingartner, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003586	003586	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003587	003587	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003588	003588	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003589	003589	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003590	003590	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003591	003591	1989 (J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
003617	003617	1989 (R. Parr and J. Goodman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003618	003618	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003619	003619	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003620	003620	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003621	003621	1989 (R. Parr, D. Everson and J. Lehman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003622	003622	1989 (R. Parr, D. Everson and J. Lehman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003623	003623	1989 (D. Everson, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003624	003624	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003625	003625	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003626	003626	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003627	003627	1989 (R. Parr, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003629	003629	1989 (R. Parr and R. Yohe, Archaeological Research Unit, UC Riverside, CA.); 2021 (H. Haas and B. Campbell, n/a)	Precontact	[redacted]	No
003630	003630	1989 (R. Parr, R. Yohe, B. Arkush and D. Everson, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003631	003631	1989 (R. Parr, R. Yohe, B. Arkush and D. Everson, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003632	003632	1989 (R. Parr, R. Yohe, B. Arkush and D. Everson, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
003633	003633	1989 (R. Parr and R. Yohe, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003642	003642	1989 (R. Parr and G. Alcock, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003643	003643	1989 (R. Parr and J. Lehman, Archaeological Research Unit, UC Riverside, CA.)	Precontact	[redacted]	No
003648	003648	1978 (Larry Bowles, n/a)	Precontact	[redacted]	No
003859	003859	1989 (C.E. Drover and D.M. Smith, Christopher Drover)	Precontact	[redacted]	No
004020	004020	1990 (C. E. Drover and D. M. Smith, Christopher Drover)	Precontact	[redacted]	No
004021	004021	1990 (C. E. Drover and D. M. Smith, Christopher Drover)	Precontact	[redacted]	No
004732	004732	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2006 (Britt W. Wilson, Morongo Band of Mission Indians); 2006 (Koral Ahmet & Sara Bholat, ECORP Consulting Inc.); 2007 (Koral Ahmet, ECORP Consulting, Inc.)	Precontact	[redacted]	No
004733	004733	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2007 (Richard Greene, BFSA (Brian F. Smith & Associates)	Precontact	[redacted]	No
004734	004734	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2007 (Richard Greene, BFSA (Brian F. Smith & Associates)	Precontact	[redacted]	No
004735	004735	1992 (C.E. Drover, D.M Smith, T. Buckley, Christopher Drover)	Precontact	[redacted]	No
004736	004736	1992 (C.E. Drover, D.M. Smith, and T. Buckley, Christopher Drover); 2003 (Daniel Ballester, None indicated)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
004737	004737	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2003 (Daniel Ballester, None indicated)	Precontact	[redacted]	No
004739	004739	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2001 (Michael Lozano, Victoria Avalos, n/a)	Precontact	[redacted]	No
004740	004740	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover)	Precontact	[redacted]	No
004741	004741	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover)	Precontact	[redacted]	No
004742	004742	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover)	Historic	[redacted]	No
004743	004743	1992 (C.E. Drover, D.M. Smith, T. Buckley, Christopher Drover); 2001 (Michael Lozano, n/a)	Precontact	[redacted]	No
007813	N/A	1983 (Jim Warner, Riv. Co. Historical Comm.)	Historic	[redacted]	No
007814	N/A	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
007818	007818	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
007819	007819	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
007821	N/A	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
007823	N/A	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
007824	N/A	1983 (Jim Warner, Riverside County Historical Comm.)	Historic	[redacted]	No
010813	006530	2000 (Antonina Delu, LSA Associates, Inc.)	Precontact	[redacted]	No
012324	N/A	1989 (J. Goodman, J. Torres, Archaeological Research Unit, UC Riverside)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
012325	N/A	1989 (J. Goodman, G. Alcock, Archaeological Research Unit, UC Riverside)	Precontact	[redacted]	No
013606	N/A	1982 (L.L. Bowles, n/a)	Precontact	[redacted]	No
014132	007754	2004 (Bergin, K. and D. Ferraro, Viejo California Associates); 2018 (C. ACCARDY)	Historic	[redacted]	No
015335	008097	2006 (Ahmet, Koral and Sara RI-06268, Bholat, ECORP Consulting, Inc.); 2014 (K. Lindgren, n/a)	Historic	[redacted]	No
015336	008098	2006 (Ahmet, Koral and Sara RI-06268, Bholat, ECORP Consulting, Inc.); 2007 (BFSA, BFSA); 2007 (Ahmet, Koral, ECORP Consulting, Inc.)	Precontact	[redacted]	No
015705	N/A	2006 (White, Laura S., Archaeological Associates)	Historic	[redacted]	No
017226	N/A	1989 (Keller, Jean A.)	Prehistoric	[redacted]	No
017917	N/A	2009 (Laura S. White, Archaeological Associates, Sun City, CA)	Historic	[redacted]	No
020316	010257	2012 (Phillip de Barros, Professional Archaeological Services)	Historic	[redacted]	No
024669	N/A	2014 (Kristina Lindgren, ECORP Consulting, Inc.)	Historic	[redacted]	No
026876	006157	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
026877	006158	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
026878	006159	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Historic	[redacted]	No
026879	006337	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
026880	006338	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
026881	006384	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No

Table 2. Previously Recorded Cultural Resources in or within 1 Mile of the Project Area

P-33-	CA-RIV-	Recorder and Year	Age/ Period	Site Description	Within APE?
026882	007328	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
026883	007329	2015 (B. Campbell and H. Haas, Rincon Consultants, Inc)	Precontact	[redacted]	No
028057	N/A	2017 (Jeanette A. McKenna, Jeanette A. McKenna Consultant)	Historic	[redacted]	No
028499	N/A	2018 (Courtney J. Accardy, Jennifer R.K. Stropes, Brian F. Smith and Associates, Inc.)	Historic	[redacted]	No
028897	012945	2015 (H. Haas, B. Campbell, Rincon Consultants, Inc)	Precontact	[redacted]	No
028898	012946	2015 (H. Haas, B. Campbell, Rincon Consultants, Inc)	Precontact	[redacted]	No
028899	012947	2015 (H. Haas, B. Campbell, Rincon Consultants, Inc)	Precontact	[redacted]	No

ECORP searched the Built Environment Resources Directory (BERD) for Riverside County and revealed that there are six resources listed on the BERD within 1 mile of the Project Area. Of these six resources, two have been evaluated as eligible for listing on a local register. There are no NRHP or CRHR listed sites, and there are no California Points of Historical Interest, California Historical Landmarks, or National Historic Landmarks within the Project Area or within the 1-mile records search radius.

ECORP examined historic-period maps and aerial images of the Project Area. Historic-period aerials depict that the Project Area was undeveloped until the 1960s (NETROnline 2022; UCSB Library 2022). In the 1960 USGS Riverside 15-minute topographic quadrangle map, one unnamed, unpaved road is shown crossing through the Project Area. In the 1967 USGS Riverside East 7.5-minute quadrangle map, one building is depicted within the central portion of the Project Area.

Historic aerial photographs of the Project Area show that the Project Area was undeveloped until the 1960s. In the 1963 aerial photographs, the southern portion of the Project Area is agricultural land, specifically an orchard (UCSB Library 2022). By 1967, majority of the Project Area was utilized as an orchard (NETROnline 2022). These conditions remain unchanged in aerial photographs from 1978, 1985, 1994, 2002, and 2014 (NETROnline 2022). At least three buildings are observed during the 1960s and a visible change of the structures was observed by the 1985 aerial. This structure change correlates with the background research conducted during the FCS 2015 report, which stated that the original homestead on the property burnt down and were rebuilt by the 1980s. By 1970s, the Project Area became an orchard, which it remained until recently, when the orchard was removed.

In the 1978 aerial photographs, the northwestern portion of the Project Area, which has remained undeveloped open space, depicts increased OHV impacts (NETROnline 2022). Increased OHV impacts is observed in aerial photographs from 1985, 1994, and 2002, where conditions currently remain unchanged (NETROnline 2022).

FCS requested a search of the Sacred Lands File by the NAHC on March 5, 2015, as part of the 2015 Phase I study. The NAHC responded on March 17, 2015, and it noted that the Sacred Lands File search failed to indicate the presence of Native American sacred lands in the vicinity of the Project Area. The NAHC Sacred Lands File search failed to indicate the presence of Native American sacred lands in the vicinity of the Project Area. The NAHC provided FCS with a list of 24 Native American individuals and organizations with traditional ties to the Project Area. Letters were sent to these specific individuals on April 22, 2015, inquiring any further information regarding the Project Area they would be willing to share. A total of four contacts responded to this outreach: San Manuel Band of Mission Indians, Rincon Band of Luiseño Indians, San Luis Rey Band of Mission Indians, and Morongo Band of Mission Indians. The NAHC Sacred Lands File Search Results and may also be found in the 2015 report, attached as Appendix E.

ECORP requested an updated search of the Sacred Lands File by the NAHC in December 2021. The NAHC responded on February 24, 2022 and noted that the Sacred Lands File search failed to indicate the presence of Native American sacred lands in the vicinity of the Project Area. The NAHC provided ECORP with a list of 21 Native American individuals and organizations with traditional ties to the Project Area. Letters were sent to the 21 Native American individuals and organizations by U.S. Postal Service on March 15, 2022, inquiring as to the interest various tribal organizations may have in participating in the upcoming field survey. Notification letters sent to, and responses received by Native American individuals and organizations at the time of writing may be found in Appendix F. Only the Pechanga responded affirmatively, and participated in the field survey with ECORP.

[redacted] The majority of the eastern portion of the Project Area has been active agricultural land since at least the 1960s and the surface of these areas has been repeatedly disturbed by farming activity throughout the years. Therefore, the prospect of encountering in-situ cultural resources within these portions of the Project Area is presumed to be low. In addition, although the historic-era orchard is no longer present, associated features and artifacts may be present on site. The likelihood that these are significant is low.

Finally, outreach to the Native American tribes resulted in four responses. On March 23, 2022, Jill McCormick of the Quechan responded to indicate no comments and deferred to more local tribes. On March 25, 2022, Paul Macarro of the Pechanga responded and accepted the invitation to participate in fieldwork. On April 18, 2022, Arysa Gonzales Romero of the Agua Caliente responded to indicate the Project is not within their traditional use area, but requested copies of technical information. On April 25, 2022, Cheryl Madrigal of the Rincon Band of Luiseño Indians responded that the Project is located within the traditional use area of the Luiseño people and is within the Rincon's specific area of historic interest.

Rincon recommended working with Pechanga and the Soboba Band of Luiseño Indians, and requested a final copy of the cultural resources inventory report for review. All correspondence between ECORP and California Native American Tribes is provided in Appendix F and the County will follow up with consultation under AB 52.

b. Field Survey Results

The original 140-acre Project Area was surveyed by FCS in 2015. According to FCS (2015:25), "overall ground visibility ranged from 20 percent in the eastern orchards to 100 percent in the western portion with very sparse vegetation coverage." As described in Attachment A, FCS located P-33-012915/CA-RIV-7181 and P-33-012916/CA-RIV-7182, but "two additional previously recorded resources within the APE ([P-33-012917/]CA-RIV-7183 and [P-33-012918/]CA-RIV-7184) were not relocated because of the degradation of the sites by natural erosion factors and orchard maintenance activities."

ECORP conducted a field visit of the original 140-acre Project Area on February 17 and April 1, 2022 to document ground conditions and to confirm the presence of the previously recorded resources within the Project Area. The February 2022 field visit revealed that the previously documented orange grove in the FCS 2015 report has since been removed. The portions of the Project Area that were part of the orange grove were now covered with a thick layer of wood chips, impacting the ground surface visibility. The presence of the four previously recorded resources was confirmed within the Project Area.

ECORP conducted an intensive pedestrian survey on March 31, 2022, of the adjacent 20-acre Gless parcel that had not been included in FCS's 2015 survey. This property is located within an adjoining property that had been used for a citrus orchard, which has since been removed. The ground surface is covered with a thick layer of wood chips, impacting the ground surface visibility. The previously recorded boundary of P-33-012916/ CA-RIV-7182 indicated [redacted]. As a result of the survey, the crew recorded two previously unrecorded resources: CA-001 and CA-002. [redacted] DPR 523 records for the two newly recorded resources are located in Confidential Appendix G.

Surface visibility during the survey ranged from poor (10 percent) to fair (60 percent) throughout the entire Project Area. Photos of the 20-acre addition to the Project Area can be found in Appendix H.

c.1 Previously Recorded Resources

Previously recorded sites consist of four [redacted] sites (P-33-012915, P-33-012916, P-33-012917, and P-33-012918). These resources are summarized below. Site records with locations, photographs, and sketch maps are provided in Appendix G. Appendix E includes additional field photographs.

P-33-012915/CA-RIV-7181

Description and Location

This site was originally recorded by Dice and Bouscaren in 2003 [redacted]

Previous Testing

According to FCS (2015: 27), "CA-RIV-7181 underwent Phase II testing in 2004 that included a surface artifact collection as well as subsurface testing (Dice and Bouscaren 2004). [redacted] FCS notes that the original Phase II testing was made in 2004 and is no longer considered adequate for current use.

Previous Evaluation

Dice and Bouscaren (2004) evaluated the site and found it to be eligible for the CRHR under Criterion 4 and considered it a unique archaeological resource under CEQA. FCS (2015) concurred that the site is likely eligible for inclusion in the NRHP and CRHR under Criterion D/4. FCS recommended additional Phase II testing to better define the site boundaries and confirm eligibility findings.

2022 Update

The site was revisited by ECORP archaeologists on February 17, and April 1, 2022. The site was located, and updated site boundaries were collected. The overall site conditions have not changed since the initial recordation.

Additional Information Needed

The boundaries of the site are still in question, as the prior testing effort is documented by hand-drawn sketch maps and field notes alone and was performed to evaluate eligibility and not to define subsurface boundaries. Although ECORP gathered updated submeter GPS boundaries of the surface manifestations, the precise limits of subsurface deposits are unclear. A Phase II investigation will allow for a better understanding of the spatial limits of the site, and to assist in project design to maximize avoidance to the greatest extent possible.

P-33-012916/CA-RIV-7182

Description and Location

This site was originally recorded by Dice and Bouscaren in 2003 [redacted].

Previous Testing

According to FCS (2015: 27), "CA-RIV-7182 underwent Phase II testing in 2004 that included a surface artifact collection as well as subsurface testing (Dice and Bouscaren 2004). [redacted] FCS notes that the original Phase II testing was conducted in 2004 and is no longer considered adequate for current use,

Previous Evaluation

Dice and Bouscaren (2004) evaluated the site through subsurface testing and did not find buried intact deposits. The result was Dice and Bouscaren's recommendation that the site does not meet the criteria for inclusion in the CRHR under any criteria. FCS, however, disagreed and suggested that this site be considered eligible for the NRHP and CRHR under Criterion D/4. FCS recommended additional Phase II testing to better define the site boundaries and confirm eligibility findings.

2022 Update

The site was revisited by ECORP archaeologists on February 17 and April 1, 2022. The site was located, and updated site boundaries were collected. The site may have been impacted by the removal of the orange grove previously present in the Project Area.

Additional Information Needed

The boundaries of the site are still in question, as the prior testing effort is documented by hand-drawn sketch maps and field notes alone and was performed to evaluate eligibility and not to define subsurface boundaries. Moreover, two previous investigations conflicted in their recommendations of eligibility. Although ECORP gathered updated submeter GPS boundaries of the surface manifestations, the precise limits of subsurface deposits are unclear. A Phase II investigation will allow for a better understanding of the spatial limits of the site, will help confirm the eligibility of the site, and will assist in project design to maximize avoidance to the greatest extent possible.

P-33-012917/CA-RIV-7183

Description and Location

This site was originally recorded by Dice and Bouscaren in 2003 [redacted]

[redacted]

Previous Testing

Dice and Bouscaren conducted Phase II testing in 2004 and observed and collected [redacted]

Previous Evaluation

Dice and Bouscaren (2004) evaluated the site through subsurface testing and did not find buried intact deposits. The result was Dice and Bouscaren's recommendation that the site does not meet the criteria for inclusion in the CRHR under any criteria.

2022 Update

Since that time, the orchard had been removed, and in 2022, ECORP successfully located the site. ECORP updated site boundaries but did not observe any associated artifacts on the surface. The site has been impacted by the removal of the orange grove previously present in the Project Area.

Additional Information Needed

The boundaries of the site are still in question, as the prior testing effort is documented by hand-drawn sketch maps and field notes alone and was performed to evaluate eligibility and not to define subsurface boundaries. Although ECORP gathered updated submeter GPS boundaries of the surface manifestations, the precise limits of subsurface deposits is unclear. A Phase II investigation will allow for a better understanding of the spatial limits of the site, and to assist in project design to maximize avoidance to the greatest extent possible.

P-33-012918/CA-RIV-7184

Description and Location

This site was originally recorded by Dice and Bouscaren in 2003 [redacted]

Previous Testing

This site was not subjected to Phase II testing by Dice and Bouscaren in 2004, based on their examination of the site and observation that topsoil in the site boundary is extremely thin (2004:36).

Previous Evaluation

Dice and Bouscaren (2004) evaluated the site based on survey level data alone and recommended that the site does not meet the criteria for inclusion in the CRHR under any criteria.

2022 Update

The site was revisited by ECORP archaeologists on February 17, and April 1, 2022. [redacted] The site was located, and updated site boundaries were collected.

Additional Information Needed

The boundaries of the site are still in question, as there are additional features that were not previously included in the original site record, and the site has not been subjected to subsurface testing. Although ECORP gathered updated submeter GPS boundaries of the surface manifestations, the precise limits of subsurface deposits is unclear. A Phase II investigation will allow for a better understanding of the spatial limits of the site, will assist in evaluating the site, and will assist in project design to maximize avoidance to the greatest extent possible.

c.2 Newly Identified Resources

CA-001. [redacted]

Additional Information Needed

This site has not been subjected to subsurface testing. A Phase II investigation will allow for a better understanding of the spatial limits of the site, will assist in evaluating the site, and will assist in project design to maximize avoidance to the greatest extent possible.

CA-002. [redacted]

Additional Information Needed

This site has not been subjected to subsurface testing. A Phase II investigation will allow for a better understanding of the spatial limits of the site, will assist in evaluating the site, and will assist in project design to maximize avoidance to the greatest extent possible.

c.3 Potential for Unidentified Surface and Subsurface Resources

The study area has the potential to contain unidentified resources on the surface that were obscured by dense vegetation around drainages, or by a dense layer of woodchips in areas of former citrus groves. The

records search update revealed that approximately 95 percent of the Project Area has been surveyed in the past. As a result of those surveys, [redacted]

Geologic maps show that the study area contains cretaceous plutonic rock composed of quartz diorite (qdi). Given the age and likely erosional rather than depositional environment of the plutonic rock terrain the Project Area is unlikely to contain deep subsurface deposits, although shallow deposits are possible in areas between the rocky outcrops that have soil formation, and surface artifact deposits may have also been moved and buried by agricultural activity.

VII RECOMMENDED MITIGATION

ECORP recommends additional Phase II studies be conducted to determine the spatial extent of each site and to complete the evaluations of significance. Until that occurs, and until the project designs are refined, recommendations for mitigation would be premature. ECORP recommends the following:

- P-33-012915/CA-RIV-7181: Phase II testing to define subsurface site boundaries and update DPR record
- P-33-012916/CA-RIV-7182: Phase II testing to define subsurface site boundaries and confirm eligibility, and associated update to DPR record
- P-33-012917/CA-RIV-7183: Phase II testing to define subsurface site boundaries and update DPR record
- P-33-012918/CA-RIV-7184: Phase II testing to define subsurface site boundaries and evaluate the site under criterion D/4, and associated update to DPR record
- CA-001: Phase II testing to define subsurface site boundaries and evaluate the site under criterion D/4, and associated update to DPR record
- CA-002: Phase II testing to define subsurface site boundaries and evaluate the site under criterion D/4, and associated update to DPR record

Following the completion of a Phase II program, ECORP will advance recommended mitigation for consideration.

VIII CERTIFICATION

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

DATE: April 27, 2022 SIGNED:

PRINTED NAME: John T. O'Connor, Ph.D., RPA

COUNTY REGISTRATION #(added to the approved consultants list by David L. Jones on September 30, 2019)

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REDACED FOR PUBLIC USE

Report Date: July 2024
Field Work Dates: April through December 2022
PAR210156; GPA220009, TTM38510

Updated Phase I and Phase II Cultural Resources Assessment for the Arroyo Vista Project, Unincorporated Riverside County, California

U.S. Geological Survey 7.5-minute Quadrangles: Riverside East (1967 photorevised 1979)

Parcel Information: APNs 245-300-001, 245-300-004

Prepared on Behalf of: Owner/Applicant:

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Keywords: Riverside County, [redacted], orchards

Results: Testing at six sites yielded negligible data; not eligible for inclusion in NRHP/CRHR

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Field Personnel: Robert Cunningham (Field Director) (909) 307-0046, Evelyn Hildebrand, RPA, Casey LeJeune, RPA, Sonia Sifuentes, Steven Wintergerst, William Gillean

MANAGEMENT SUMMARY

a) Purpose of Investigation

TTLC Riverside Chicago, LLC proposes to develop the Arroyo Vista Project on two parcels located at Chicago Avenue in Riverside County, near the community of Woodcrest. In 2015, First Carbon Solutions (FCS) conducted a Phase I Cultural Resources Assessment in support of the Project. The 2015 FCS report summarizes the results of the Phase I study that covered 120 acres of the current Project Area. ECORP Consulting, Inc. conducted an update to the Phase I study in 2022 to include an additional 20 acres added to the Project Area since the original study, fill data gaps in the original study, and to present data consistent with Riverside County standards. The Assessor's Parcel Numbers (APN) for the two properties included in the Project Area are 245-300-001 and 245-300-004. The total Project Area contains 140 acres of land.

On April 27, 2022, ECORP Consulting, Inc. submitted an updated Phase 1 cultural resources inventory report to the County that included a recommendation for Phase II testing at sites P-33-012915/CA-RIV-7181, P-33-012916/CA-RIV-7182, P-33-012917/CA-RIV-7183, P-33-012918/CA-RIV-7184, CA-001, and CA-002. Under a County-approved testing plan, ECORP implemented the Phase II study in December 2022 to determine if there are intact archaeological deposits present that could, upon further examination, produce data that satisfy the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) criteria. Because preservation in place is the preferred treatment of pre-contact archaeological sites, the fieldwork focused on establishing the site boundaries.

Subsequently, field visits with culturally affiliated tribes identified additional features. This Phase II testing report has been updated to include all features identified to date.

b) Major Findings

Testing at these sites was carried out from December 7 to 21, 2022. Very little archaeological data was observed during testing.

c) Summary of Significance

The results of the testing indicate that sites P-33-012915/CA-RIV-7181, P-33-012916/CA-RIV-7182 are eligible for listing in the NRHP and CRHR. Sites P-33-012917/CA-RIV-7183, P-33-012918/CA-RIV-7184, CA-001, and CA-002 are not eligible. Whether or not any of the non-eligible sites are significant as tribal cultural resources is addressed separately by the County through tribal consultation.

d) Summary of Recommendations

Avoidance and preservation in place are recommended for the two eligible sites plus the bedrock features for the non-eligible sites. If avoidance is not feasible for part or all of these, then data recovery or relocation would be necessary. For sites preserved in place, temporary construction fencing, controlled grading, and deed restrictions are recommended. Construction-related measures such as worker awareness training, tribal monitoring during construction, and repatriation and reburial procedures, are also recommended.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
AB	Assembly Bill
APN	Assessor Parcel Number
BERD	Built Environment Resource Directory
BP	Before present
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
COA	County Condition of Approval
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
ECORP	ECORP Consulting, Inc.
EIC	Eastern Information Center
FCS	First Carbon Solutions
MLD	Most Likely Descendant
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PRC	Public Resources Code
RPA	Registered Professional Archaeologist
SB	Senate Bill
U.S.	United States of America
UCSB	University of California, Santa Barbara
USGS	U.S. Geological Survey

I. INTRODUCTION AND SETTING

a) Project Description

The Arroyo Vista Project is located on parcels APN 245-300-001 and 245-300-004 at Chicago Avenue in Riverside County, near the unincorporated community of Woodcrest. TTLC Riverside Chicago, LLC proposes to construct a residential development on approximately 140 acres. The proposed project includes the construction of single-family residential lots, open space and preserve areas, trails, parks, water quality basins, and associated infrastructure such as roads, sidewalks, water and sewer lines, and utilities.

Project construction will entail grubbing, clearing, grading, trenching, and excavation in the development footprint. The exceptions include the open space channel that is oriented northwest to southeast through the approximate center of the project area – this area will remain largely untouched.

b) Project Location

The Project Area is located within the unincorporated Woodcrest area of Riverside County, south of Twin Lakes Drive, north of Iris Avenue, west of Chicago Avenue, and east of an unnamed, unpaved road connecting Iris Avenue to Ridge Canyon Drive. A regional overview map is provided in Appendix A.

c) USGS Quad Location

As shown on the U.S. Geological Survey (USGS) 7.5-minute Riverside East, California topographic quadrangle map (1967, photorevised 1980), the Project Area is in Section 24 of Township 3 South, Range 5 West of the San Bernardino Base and Meridian. The location is shown in the maps in Appendix A.

d) Field Personnel

Field personnel consisted of ECORP Consulting, Inc. archaeologists Robert Cunningham (Field Director), Evelyn Hildebrand, RPA, Casey LeJeune, RPA, Sonia Sifuentes, RPA, William Gillean, and Steve Wintergerst. Lisa Westwood, RPA served as principal investigator. Fieldwork was monitored by tribal representatives from the Soboba Band of Luiseno Indians and the Pechanga Band of Luiseno Indians.

Robert Cunningham has 17 years of experience in cultural resources management, with an emphasis on the recording, analysis, and evaluation of historic-period resources. He has participated in all aspects of archaeological fieldwork, including survey, test excavation, and construction monitoring. He has served as Field Director for archaeological inventories and site evaluation projects and has worked on San Diego County projects under ECORP's blanket purchase order since 2010. He has recorded and mapped numerous pre-contact and historic-period archaeological sites and has identified and documented hundreds of pre-contact and historic artifacts. Mr. Cunningham has prepared numerous archaeological site records and has authored and contributed to a variety of cultural resources technical reports.

Evelyn Hildebrand, M.A., RPA, is an Associate Archaeologist with over five years of experience working in cultural resource management across California. She holds an M.A. in Applied Archaeology and a B.A. in Anthropology with a focused curriculum in archaeology. She meets the Secretary of the Interior's Professional Qualifications Standards for pre-contact and historic archaeology. She has participated in various aspects of archaeological fieldwork including survey, test excavation, data recovery, artifact analysis, construction monitoring, both as an archaeological monitor and field lead, and the recording and recovery of pre-contact and historic-period

archaeological sites. She has also worked with Egypt's Department of Antiquities in collaboration with the Wadi el-Hudi expedition in 2019 in the desert southeast of Aswan, Egypt, using photogrammetry to record and create digital 3D models of endangered Middle Kingdom mining sites.

Casey LeJeune, RPA is a Staff Archaeologist who has worked in cultural resource management since 2020, with experience in the southeast, the southwest, and southern California. She holds an M.A. in Anthropology, with focus in forensic anthropology and bioarchaeology. She meets the Secretary of the Interior's Professional Qualifications Standards for pre-contact and historic archaeology. She has participated in fieldwork on forensic and historic burials, survey, large-scale data recovery, monitoring, and in-field lithic analysis. Ms. LeJeune also has extensive labwork in human osteology and analysis of historic and pre-contact artifacts.

Sonia Sifuentes, RPA is a Senior Archaeologist at ECORP and has more than 15 years of experience in cultural resources management, primarily in southern California. Ms. Sifuentes holds a M.S. in Archaeology of the North. She has participated in and supervised numerous surveys, test programs, and data recovery excavations for both pre-contact and historical sites; and has cataloged, identified, and curated thousands of artifacts. She has conducted evaluations of cultural resources for eligibility for the NRHP and CRHR. Ms. Sifuentes is experienced in the organization and execution of field projects in compliance with Section 106 of the NHPA and CEQA. She has contributed to and authored numerous cultural resources technical reports, research designs, and cultural resources management plans.

William Gillean is an on-call archaeologist with ECORP Mr. Gillean has over 15 years of experience in cultural resource management (CRM) and extensive experience working on projects requiring inventory, testing, and data recovery efforts. He has performed field work throughout Riverside, San Bernardino, Los Angeles, Inyo, Imperial and San Diego Counties, including projects in the Mojave, and Colorado Deserts, the San Joaquin Valley, and throughout the San Bernardino National Forest. He has worked for several federal and state government agencies and has completed work on various military installations in California and Arizona. Mr. Gillean has monitored for cultural resources during project implementation and worked on various projects involving recording of historical-period sites as well as authoring or contributing to numerous technical reports. Mr. Gillean holds a Bachelor's of Science degree from Cal Poly, Pomona.

Steven Wintergerst is an Associate Archaeologist with 11 years of experience in cultural resources management. He holds a B.A. in Anthropology. Mr. Wintergerst has participated in all aspects of archaeological fieldwork and laboratory process, with extensive experience throughout California and western Arizona. His experience has involved working as an archaeological crew chief, archaeological technician, archaeological monitor, paleontological monitor, and paleontological preparator. He is experienced in the organization and execution of field projects in compliance with CEQA and Section 106 of the NHPA.

Principal Investigator Lisa Westwood, RPA has 30 years of experience and meets the Secretary of the Interior's Professional Qualifications Standards for pre-contact and historical archaeology. She holds a B.A. in Anthropology and an M.A. in Anthropology (Archaeology). She is the Director of Cultural Resources for ECORP.

e) Previous Work from Phase I Survey

In 2015, First Carbon Solutions (FCS) conducted a Phase I Cultural Resources Assessment in support of the Riverside Chicago Avenue Project (Project). The FCS 2015 report summarizes the results of the Phase I study that covered 120 acres of the current Project Area. ECORP Consulting, Inc. conducted an update to the 2015 Phase I study in 2022. The purpose of the update was to include an additional 20 acres added to the Project Area since

the original study, cover lapses in the original study, and to present data consistent with Riverside County standards. Between December and April 2021, ECORP requested a cultural resources records search from the Eastern Information Center (EIC; University of California, Riverside), requested a search of the Sacred Lands File from the Native American Heritage Commission (NAHC), and conducted a field visit and a second intensive systematic pedestrian survey of the additional 20 acres.

The updated records search indicated that 55 cultural resources investigations have been conducted within the 1-mile records search radius between 1974 and 2016. Of these studies, two investigations overlapped the Project Area, covering more than 95 percent of the area. The records search also showed that four cultural resources have been recorded within or adjacent to the Project Area. One hundred and five previously recorded cultural resources are located within 1 mile of the Project Area.

The results of the Sacred Lands File search by the NAHC did not indicate the presence of Native American sacred lands within the vicinity of the Project Area. In addition to the search of the Sacred Lands File, the NAHC identified 21 Native American groups and individuals with historical and traditional ties to the Project Area.

ECORP conducted field visits in February and April 2022 to document ground conditions and to revisit four previously recorded sites. During the field visits, ECORP confirmed the presence of the four previously recorded resources and updated site boundaries. Previously recorded sites consisted of four bedrock milling sites: P-33-012915, P-33-012916, P-33-012917, and P-33-012918.

In March 2022, ECORP conducted an intensive pedestrian survey of the 20-acre addition to the Project Area. As a result of the 20-acre survey, ECORP identified two newly recorded resources. The two newly recorded resources consist of two bedrock milling feature sites: CA-001 and CA-002. Surface visibility during the survey ranged from fair (60 percent) to poor (10 percent) throughout the entire Project Area. Due to poor ground visibility, there exists the potential for additional resources to be present within the Project Area; however, due to the past agricultural use of the property, in-situ cultural deposits are unlikely.

In 2024, ECORP, the County, and representatives from Pechanga Band of Indians and Soboba Band participated in field visits. As a result, additional features were identified, including temporary field numbers CAR-04, CAR-05, CAR-08, CAR-09, CAR-10, CAR-11, CAR-12, and CAR-13-I.

ECORP recommended that all known sites be avoided and preserved in place. If avoidance is not possible, ECORP recommended additional Phase II studies be conducted for resources that will be impacted by Project activities. Subsequently, the County requested a Phase II work plan, which was developed in consultation with culturally affiliated tribes and approved by the County in November 2022. The current Phase II report documents the methods and results of the Phase II study and was updated in 2024 to add the resources observed during the tribal visits.

f) Topographic Description and Elevation

The Project Area is in western Riverside County, near the unincorporated community of Woodcrest, approximately 7.39 miles east of the City of Norco, 5.09 miles northwest of the City of Perris, and 0.5 mile south of the City of Riverside. The Project Area is situated at an elevation 1,403 feet above mean sea level in the Mead Valley, located east of the Santa Ana Mountains and west of the San Jacinto Mountains in Southern California. The San Bernardino Mountains are to the north. Local topography is undulating terrain crossed by seasonal arroyos. The

climate of the Project Area is somewhat comparable to the high deserts of Southern California, though with a more moderate coastal temperature range than the inland deserts.

g) Disturbance and Present Land Use

The eastern portion of the Project Area is a former orchard, and the western portion is undeveloped grassland. Historic aerial photographs show that the eastern portion of the Project Area was undeveloped land from 1931 to 1962 prior to being utilized for agriculture. In aerial photographs from 1962, a house and two additional built structures are visible within the Project Area, and the southern portion of the Project Area has been planted for orchards (NETROnline 2022; UCSB Library 2022). Since 2018, the last year for which aerial photographs of the Project Area are available, the orchards and irrigation features have been removed and the ground surface is covered in a dense layer of wood chips. The western undeveloped portion of the Project Area has been disturbed by Off-Highway Vehicle (OHV) activity and modern dumping.

Surrounding parcels are utilized for residential, small-scale agricultural use, and recreational purposes with notable increases in residential development since the late 1970s. Some of the adjacent land still sits vacant. Investment in community-oriented projects is evident in the presence of Martin Luther King High School, John F. Kennedy Elementary School, and Orange Terrace Park to the east of the Project Area.

The orchard referenced above was present at the time of the FCS survey in 2015 but had been removed before ECORP's 2022 updated Phase I survey. As a result of the removal of the orchard, field crews had better ground surface visibility with which to confirm and record sites.

h) Vegetation

Vegetation within the Project Area consisted of low-lying invasive grasses in formal agricultural areas, and dense and tall vegetation along drainages and fence lines. Much of the property has undergone decades of extensive agricultural use. The Project Area contains non-native grassland characterized by Russian thistle and other non-native grasses and scrub.

i) Geology

Local geology can be characterized as cretaceous period plutonic rocks of peninsular ranges (qdi) composed of quartz diorite (Dibblee 2003). Surface sediments within the Project Area are mainly composed of sandy loam alfisols, entisols, and inceptisols resulting from granite-derived alluvium. Base landforms are characterized as alluvial fans and rocky outcrops. Most of the Project Area contains three soil types: Fallbrook sandy loam coarse sandy loam with 8 to 15 percent slopes, Vista coarse sandy loam with 8 to 15 percent slopes, and Cieneba rocky sandy loam with 15 to 50 percent slopes. Other soil types that overlap the Project Area include Cieneba sandy loam, Bonsall fine sandy loam, and Handord coarse sandy loam (Soilweb 2022).

II. PRE-CONTACT CONTEXT

The pre-contact context of the Project Area is provided in summary form below. The full context is provided in the FCS 2015 report and ECORP 2022 Updated Phase I report, which are hereby incorporated by reference.

The first inhabitants of Southern California from 12,000 to 10,000 years before present were big game hunters and gatherers exploiting extinct species of Pleistocene megafauna (e.g., mammoth and other Rancholabrean fauna). Local "fluted point" assemblages composed of large spear points or knives are stylistically and technologically

similar to the Clovis Paleo-Indian cultural tradition dated to this period elsewhere in North America (Moratto 1984). Archaeological evidence for this period in Southern California is limited to a few small temporary camps with fluted points found around late Pleistocene lake margins in the Mojave Desert and around Tulare Lake in the southern San Joaquin Valley (Rondeau, Cassidy, and Jones 2007).

Approximately 10,000 years ago at the beginning of the Holocene, warming temperatures and the extinction of the megafauna resulted in changing subsistence strategies with an emphasis on hunting smaller game and increasing reliance on plant gathering. Artifacts include large leaf- shaped points; leaf-shaped knives; large ovoid, domed, and rectangular end and side scrapers; engraving tools; and crescentics (Koerper, Langenwalter, and Schroth 1991).

The Encinitas Tradition (Warren 1968) and the Milling Stone Period (Wallace 1955) (8,500 to 3,500 years before present) refer to a long period of time during which small mobile bands of people who spoke an early Hokan language foraged for a wide variety of resources including hard seeds, berries, and roots/tubers (yucca in inland areas), rabbits and other small animals, and shellfish and fish in coastal areas. Residential bases have hearths and fire-affected rock indicating overnight stays and food preparation. Residential bases along the coast have large amounts of shell and are often termed shell middens. The resource acquisition locations have no evidence for overnight stays. The most common artifacts found in residential bases are manos and milling stones (metates) and large core-cobble chopping tools including hammerstones and scraper planes.

The native people of Southern California (north of a line from Agua Hedionda to Lake Henshaw in San Diego County) spoke Takic languages that form a branch or subfamily of the Uto-Aztecan language family. The Takic languages are divided into the Gabrieliño-Fernandeño language, the Serrano-Kitanemuk group (the Serrano, which includes the Vanyume dialect] and Kitanemuk languages), the Tataviam language, and the Cupan group (the Luiseño-Juaneño language, the Cahuilla Language, and the Cupeño language) (Golla 2011). According to Sutton (2009), Takic speakers occupied the southern San Joaquin Valley before 3,500 BP.

With time, mobility greatly decreased compared to the Encinitas Tradition and small groups of related people lived in semi-permanent residential bases near a water source. Subsistence changed from a mobile foraging pattern to a collector pattern (Binford 1980). People collected resources and brought them back to the residential base. People stayed overnight in temporary camps when away from the residential base.

The complex hunter-gatherer cultures encountered by the Spaniards in Southern California developed during the Late Prehistoric Period. People lived in villages of up to 250 people located near permanent water and a variety of food sources. Each village was typically located at the center of a defended territory from which resources for the group were gathered. Small groups left the village for short periods of time to hunt, fish, and gather plant foods. While away from the village, they established temporary camps and created locations where food and other materials were processed. Subsequently, the introduction of the bow and arrow made deer hunting more efficient. Acorn processing was labor intensive, requiring grinding in a mortar and leaching with water to remove tannic acid (Basgall 1987). Many of the mortars are bedrock mortars. Seeds from sage and grasses, goosefoot, and California buckwheat were collected and ground into meal with manos and metates. Seeds were used as the storable staple in areas which lacked acorn-producing oak groves. Protein was supplied through the meat of deer, rabbits, and other animals, hunted with bow and arrow or trapped using snares, nets, and deadfalls. On the coast, fish were obtained using shell fishhooks and nets.

The Project Area is located within the territory known to have been occupied by the Cahuilla group of Native Americans, and near territory occupied the Gabrieliño and Luiseño groups of Native Americans at the time of contact with Europeans, around A.D. 1769. Additional ethnohistoric context is provided in the updated Phase I report (ECORP 2022).

III. HISTORIC CONTEXT

The historic context of the Project Area is provided in summary form below. The full context is provided in the FCS 2015 report and ECORP 2022 Updated Phase I report, which are hereby incorporated by reference.

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. European colonization of California began later, with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and towns were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory (Castillo 1978).

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California. The Mexican government closed the missions in the 1830s and former mission lands were granted to retired soldiers and other Mexican citizens for use as cattle ranches. The Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850 (Cleland 1941).

In the following decades, the local citrus industry grew and agriculture was the predominant economy of the area. The Great Depression in the 1930s, however, brought hardships to the region and some farmers were forced to sell their orchards. During the U.S. involvement in World War II, the San Bernardino area was made headquarters of the Western Defense Command because of its safe distance from the threat of an aircraft carrier-based aerial attack and its status as a regional rail, highway, and communications hub (Belden 1963; Brown 1985). Following World War II, agriculture declined as industrial and suburban development increased. In the 1950s and 1960s construction of State Highways 91 and 60 through the area stimulated new housing and commercial growth, and Riverside stretched southward and northward along the freeway. By the 1980s, the expanding city limits had reached northward to the Riverside/San Bernardino County Line and agriculture had nearly disappeared (Brown 1985).

Woodcrest is a census designated place in Riverside County. Although its name comes from Woodcrest Acres, a subdivision constructed in 1924, people have claimed it is attributed to the people with variations of the surname Wood who were involved in the early history of the area. One such person was John C. Woodard, an Ohio native, who built a homestead in Woodcrest in 1884. The Woodcrest area was initially populated by dry land grain farmers in the late 19th century (Find a County n.d.). In 1894, the population had grown enough for the Riverside County Board of Supervisors to establish a school in the area, and on February 6 of that year they authorized the Oak Glen School District.

The City of Riverside, and the western county, remained the center of the navel orange business, which soared in the 1880s. As demand for citrus grew, along with the county's citrus acreage, citrus quickly became the economic base for the area. In 1893 growers formed the Southern California Fruit Exchange, a cooperative, known today as Sunkist Growers (Lee 2010).

IV. RESEARCH GOALS

The County-approved testing plan (ECORP 2022) presented several research topics, which the testing program was designed to address. These topics are summarized below; additional detail is provided in the testing plan.

The data needed to answer these questions would be found from a determination of each site's boundaries, depth, stratigraphy, integrity, contents (material culture and non-artifactual materials), spatial distribution of artifacts and faunal remains, cultural affiliation, and any chronological indicators.

a) Activities and Site Function

What activities other than acorn processing, if any, took place at the sites? Is there a full range of activities represented such as would be characteristic of a habitation site or only a limited set of activities? Is there evidence for lithic tool production and what techniques were used? Did techniques change over time? Data requirements to address these questions include tools classified functionally and debitage classified technologically. If subsurface features (hearths, ovens) are present, the type and number of features will also help address these questions.

b) Internal Site Organization

Are there distinct manufacturing, processing, or food preparation areas within the sites? Were male and female activities carried out in different areas of a site? Are distinct activity areas associated with each outcrop containing bedrock mortars or was a single activity area used by everyone using any of the bedrock mortars at the site? Data requirements include maps of the spatial distribution of tools, debitage, subsistence remains, and features. If the site is small and there are few categories that do not vary spatially, this domain cannot be addressed.

c) Subsistence Patterns

Were resources, other than acorns, brought to the sites, prepared, and consumed? Is there evidence for specialization or intensification of resource use? Specialization would be indicated by large numbers of the remains of a single species. Intensification would be indicated by reliance on resources that require greater amounts of labor to procure or process. To address questions about subsistence, a reliable sample of plant or animal subsistence remains would be necessary.

d) Technology

Technology serves as the interface between humans and nature, providing a means of extracting resources as well as manipulating the carrying capacity of environments. How technologies are organized speaks not only to the manner in which pre-contact populations manufactured and used artifacts but provides important data regarding patterns of mobility and tool recycling. As with other research themes identified for this evaluation, regional trends show important changes in technology over the last 10,000 to 12,000 years. Both flaked- and groundstone assemblages show a shift from more formalized, transported tools in the early- and mid-Holocene, to more expedient implements in late pre-contact times. Direct data needed to address such research issues will emerge from analysis of the tool assemblages collected from sites. Analytical methods must be structured to recover

appropriate information on tool lithology, morphology, mode of production, functional characteristics, levels of modification and wear, and condition at time of discard. Debitage components will be just as important as tools in indicating whether onsite or offsite reduction occurred. Contextual data require careful assessment of tool and stone distributions in the area to secure inferences regarding point-of-material origin. Finally, as with other research questions, these studies will only be as good as their spatial-temporal controls allow, dependent on assemblages from discrete, well-dated archaeological deposits. This research issue would be applicable to all site types; however, it will be most useful with the category of Temporary Camps, Lithic Scatters, and Lithic Sources/Quarries.

e) Trade Interactions

Understanding long-range trade and exchange networks is a major research domain of the region. This large research domain, which is applicable to all site types, is understood as concerning the research areas such as the change of material types over time, presence of culturally diagnostic artifacts, presence of non-local or exotic materials, and similar indicators.

f) Chronology and Temporal Patterning

Chronological controls are essential for any kind of integrative archaeological analysis. They are necessary not only to date artifacts, features, and site deposits, but also to trace regional trends in assemblage composition and pre-contact behavior. No matter how rich in artifacts or organic remains, deposits of unknown or uncertain temporal affinity will have limited interpretive value. Data needed to assess and refine chronological issues relate both to temporally indicative data and to the careful recordation of spatial-temporally intact archaeological deposits and assemblages. Exploring discrete stratigraphic and feature contexts will be key to establishing chronological control; without good context, little can be done to independently assess the placement of artifact types, reduction strategies, or raw material use profiles. This research issue would be applicable to all site types.

V. METHODS

a) General Testing Methods

In accordance with California Government Code 4216-4216.9 and California Division of Occupational Safety and Health (Cal/OSHA) Title 8, Chapter 4, Subchapter 4, Article 6, Section 1541, prior to excavation, ECORP contacted Dig Alert. On December 7, ECORP delineated the excavation location with white pin flags and contacted Dig Alert (Ticket # A223390469-00A). AT&T, SoCal Gas, Utiliquest for SCE, Western Municipal Water and Sewer, and Spectrum responded to ECORP prior to excavation and all but AT&T confirmed that there were no known underground utilities within the area being excavated. An automated response from AT&T noted the presence of switching, routing, and transmission facilities in the immediate area but a visit to the work area by AT&T personnel noted there was no conflict with our work area and AT&T facilities. The remaining service providers did not respond within the required timeframe. All subsurface testing avoided marked underground utilities.

Following utilities clearance, ECORP carried out the Phase II testing plan as approved by Riverside County. Fieldwork began on December 7, 2022 and concluded on December 21, 2022. Subsurface testing consisted of a combination of auguring and strategically placed shovel test units at or around each of the sites. The field methods were conducted with the intention to be minimally invasive and only include enough excavation needed to confirm presence or absence of cultural deposits with the goal of maximizing avoidance and preservation in place. ECORP also recognizes the effect of excavation on descendent communities and extended the opportunity

to any interested and consulting tribes to be present during the testing fieldwork. The Pechanga Band of Luiseño Indians and Soboba Band of Luiseño Indians both chose to have tribal cultural resource monitors present throughout testing. Moreover, ECORP performed only in-field identification and documentation, and did not collect, analyze, or curate any observed materials. All materials were immediately returned to their place of origin before backfilling, as agreed upon by the tribes. Photographs documenting the testing program are provided in Appendix B.

b) Sampling Strategies

The testing plan proposed to place auger tests around the outside of the site boundaries to confirm or modify the original alignment of those boundaries. The plan allowed for substitution of auger tests with shovel test units, and this was modification was implemented following the first day of testing upon consensus with ECORP field staff and the Native American tribal monitors in the field. Based on input from tribal representatives on site, the County directed ECORP to abandon the auguring after eight were placed and proceed exclusively with shovel test units after conducting an initial series auger tests. Shovel test units were placed around the outside of existing site boundaries in approximately equal distribution of distance. Changes in site conditions since the Project Area was last surveyed caused some unrecorded surface artifacts to be visible, and test unit locations accounted for these when they could be ascribed to an existing site.

In the case of a positive test unit, additional units were placed in five-meter increments moving away from the site boundary until they were culturally sterile. Based on the testing plan, input from tribal representatives, and findings in the field, test units were placed around each of the six sites and feature.

c) Testing Locations

The locations of test units were selected in the field based on topography and location relative to bedrock and approved by on-site tribal representatives before every unit was excavated. Table 1 summarizes the total number of units by site excavated. A map of testing locations is provided in Appendix C.

Table 1. Number of Excavated Units by Type and Site

Site or Feature	Total Augers	Total Shovel Tests
P-33-12915 (CA-RIV-7181)	0	15
P-33-12916 (CA-RIV-7182)	0	14
P-33-12917 (CA-RIV-7183)	8	4
P-33-02918 (CA-RIV-7184)	0	9
CA-01	0	5
CA-02	0	9
TOTALS	8	56

d) Excavation and Screening Methods

Augers were excavated by hand and had a diameter of approximately eight inches. Shovel tests were approximately 50 cm in diameter in arbitrary 20 cm levels unless clear cultural stratigraphy was observed and

excavated. All units were hand excavated to a depth of 40 cm or until a restrictive feature such as bedrock or hardpan soil was encountered. Shovel test units which were positive for cultural material were terminated at the depth the material was found. All soils from auger and shovel test units were dry screened using 1/8-inch wire mesh screens. For each test unit, opening and closing photographs were taken, and soil characteristics were recorded for the surface and the bottom of each 20 cm level.

e) Wet Screening

Wet screening was not employed during the testing and was not required by the County-approved testing plan.

f) Scientific Sampling

Because of the use of a zero-collection policy, scientific sampling was not employed during the testing and was not required by the County-approved testing plan.

g) Laboratory Methods

Because of the use of a zero-collection policy, laboratory analysis was not employed during the testing. All cultural material located inside test units was documented in the field and then immediately reburied.

h) Curation

Because of the use of a zero-collection policy, curation was not employed during the testing.

i) Native American Consultation

The County planning department carried out tribal consultation with the Agua Caliente Band of Cahuilla Indians, Pechanga Band of Luiseno Indians, and the Soboba Band of Luiseno Indians as part of environmental review under the California Environmental Quality Act. The County sought comments from the tribes on the testing plan prior to authorizing the testing to commence. Tribal consultation by the County is ongoing.

VI. RESULTS

Section X of the County's Phase II report guidelines requires information on site boundaries, depth, age, integrity, stratigraphy, contents, and spatial distribution. This information is provided on a site-by-site basis in the following sections. DPR update forms are provided in Confidential Appendix D.

a) P-33-12915/CA-RIV-7181

This site was originally recorded by Dice and Bouscaren in 2003 and was described as [redacted] bedrock outcrops with [redacted] milling slicks on the exposed surface. As originally recorded, the site comprised [redacted] Stone tools and lithic debitage were observed within the vicinity of the milling features. According to FCS (2015: 27), "CA-RIV-7181 underwent Phase II testing in 2004 that included a surface artifact collection as well as subsurface testing (Dice and Bouscaren 2004). Recovered materials originated from five distinct surface lithic scatters and three of the four subsurface shovel test pits. In total, approximately 150 artifacts were collected including roughly 130 flakes from chert, metavolcanic, obsidian and quartz sources. The remaining artifacts include manos or mano fragments, a fractured metate, cores or core fragments, bifaces and reworked bifaces, fire-affected rocks, and hammerstones. A single notched quartz projectile point was also recovered as well as hundreds of small mammal bone fragments, some of which were fire-affected. Dice and Bouscaren believed that they encountered the remains of an eroded

hearth and associated prehistoric food sources at a shovel test location in the southwestern portion of the site." The current disposition of the observed artifacts reported by Dice and Bouscaren is unknown to ECORP.

After testing, Dice and Bouscaren (2004) cited a total of [redacted]. FCS noted that the original Phase II testing was conducted in 2004 and is no longer considered adequate for current use. Dice and Bouscaren (2004) evaluated the site and found it to be eligible for the CRHR under Criterion 4 and considered it a unique archaeological resource under CEQA. FCS (2015) concurred that the site is likely eligible for inclusion in the NRHP and CRHR under Criterion D/4. FCS recommended additional Phase II testing to better define the site boundaries and confirm eligibility findings.

The site was revisited by ECORP archaeologists on February 17 and April 1, 2022. The site was located, and updated site boundaries were collected. The overall site conditions have not changed since the initial recording. The updated site boundary Is illustrated in Appendix C.

The shovel test units placed by ECORP around CA-RIV-7181 were dug in arbitrary 20-centimeter levels, as no cultural stratigraphy was observed in excavation. Soil on the surface at the testing spots consisted of sandy loam in varying shades of brown with less than five percent sub-angular gravel present. Test unit number 44 was the only one at the site with an anomalous surface, because it was placed in an area of [redacted]. The color of the surface soil in this area was a reddish yellow and the compaction and amount of clay in the soil was greater than the other areas tested. Below the surface, the soil in all the test units contained varying levels of clay and was recorded as varying shades of dark brown. Those which were terminated above a depth of 40 centimeters due to compaction contained the most clay. Disturbance from burrowing animals and granite deposits were also observed in multiple test units, with some having to be terminated due to reaching bedrock. Table 2 presents the results of testing at CA-RIV-7181.

Table 2. Testing Results for P-33-12915/CA-RIV-7181

Date	Identifier	Unit Type	Results	Depth at Termination	Reason for Termination	Artifacts
12-19-22	STP-42	STP	Negative	40cm	Sterile	-
12-20-22	STP-43	STP	Negative	17cm	Hardpan	-
12-20-22	STP-44	STP	Negative	10cm	Hardpan	-
12-20-22	STP-45	STP	Negative	35cm	Hardpan	-
12-20-22	STP-46	STP	Negative	25cm	Hardpan	-
12-20-22	STP-47	STP	Positive	38cm	Positive	1 jasper shatter and 1 obsidian flake
12-20-22	STP-48	STP	Negative	25cm	Hardpan	-
12-20-22	STP-49	STP	Positive	30cm	Positive	1 basalt flake
12-21-22	STP-50	STP	Negative	40cm	Sterile	-
12-21-22	STP-51	STP	Positive	17cm	Positive	1 quartz flake and 1 chalcedony flake
12-21-22	STP-52	STP	Negative	38cm	Hardpan	-

Table 2. Testing Results for P-33-12915/CA-RIV-7181						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-21-22	STP-53	STP	Negative	40cm	Sterile	-
12-21-22	STP-54	STP	Positive	34cm	Positive	Basalt flake
12-21-22	STP-55	STP	Negative	40cm	Sterile	-
12-21-22	STP-56	STP	Negative	38cm	Hardpan	-

Testing results around CA-RIV-7181 yielded four positive shovel test units containing a total of 6 flakes. In addition to this, multiple surface artifacts (primarily lithic debitage) were observed, which informed the locations chosen for test excavations. A shell bead was observed by the County and a representative of the Pechanga during a field visit on December 8. By accounting for those surface resources outside of the existing site boundary when placing test units, the boundary of the site was expanded to extend to the western border of the Project Area and to include more area to the south and west than was part of the previous site boundary. The positive shovel test units, numbers 47, 49, 51, and 54, were included inside of the revised site boundary. Each time a positive unit was encountered, a new test unit was placed approximately five meters further from the existing site boundary. All these units were negative for cultural material, so the revised site boundary did not include those areas.

b) P-33-12916/CA-RIV-7182

This site was originally recorded by Dice and Bouscaren in 2003 in the east-central portion of the project area and was described as a 2.5-acre site composed of [redacted] bedrock outcrops with [redacted] milling slicks on the exposed surface with debitage observed within the vicinity of the milling features. According to FCS (2015: 27), "CA-RIV-7182 underwent Phase II testing in 2004 that included a surface artifact collection as well as subsurface testing (Dice and Bouscaren 2004). Recovered materials originated from two distinct surface lithic scatters and three of the four subsurface shovel test pits. In total, approximately 100 artifacts were collected, including mostly flakes from chert, metavolcanic, obsidian and quartz sources. The remaining artifacts include a ceramic buffware sherd broken into three smaller fragments, three bifaces, a drill fragment, fire-affected rocks, and numerous small mammal bone fragments, some of which were fire-affected. Dice and Bouscaren believed that he encountered the remains of an eroded hearth and associated prehistoric food sources at a shovel test location in the central portion of the site." The current disposition of the observed artifacts reported by Dice and Bouscaren is unknown to ECORP.

Similar to CA-RIV-7181, FCS notes that the original Phase II testing was conducted in 2004 and is no longer considered adequate for current use. Dice and Bouscaren (2004) evaluated the site through subsurface testing and did not find buried intact deposits. The result was Dice and Bouscaren's recommendation that the site does not meet the criteria for inclusion in the CRHR under any criteria. FCS, however, disagreed and suggested that this site be considered eligible for the NRHP and CRHR under Criterion D/4. FCS recommended additional Phase II testing to better define the site boundaries and confirm eligibility findings.

The site was revisited by ECORP archaeologists on February 17 and April 1, 2022. The site was located, and updated site boundaries were collected. The site may have been impacted by the removal of the orange grove previously present in the Project Area.

All the shovel test units placed by ECORP around CA-RIV-7182 were excavated in arbitrary 20-centimeter levels, as no cultural stratigraphy was observed. Surface soil at the testing locations consisted of sandy loam in varying shades of dark brown, with small amounts of sub-angular gravel present. There was substantial disturbance in the form of wood chips from the former orange orchard covering most of the surface. Below the surface, substantial deposits of degrading granitic deposits were encountered around the site, with some test units containing large rocks or requiring termination due to bedrock. The soil around CA-RIV-7182 was not compact through the second level in most units, though some did contain deposits of clay which created heavy compaction. Table 3 summarizes the results of test excavations around CA-RIV-7182.

Table 3. Testing Results for P-33-12916/CA-RIV-7182

Date	Identifier	Unit Type	Results	Depth at Termination	Reason for Termination	Artifacts
12-15-22	STP-28	STP	Negative	40cm	Sterile	-
12-15-22	STP-29	STP	Negative	40cm	Sterile	-
12-15-22	STP-30	STP	Positive	20cm	Positive	Quartz flake
12-15-22	STP-31	STP	Negative	40cm	Sterile	-
12-15-22	STP-32	STP	Negative	32cm	Hardpan	-
12-16-22	STP-33	STP	Negative	38cm	Hardpan	-
12-16-22	STP-34	STP	Negative	20cm	Bedrock	-
12-16-22	STP-35	STP	Negative	40cm	Sterile	-
12-16-22	STP-36	STP	Negative	40cm	Sterile	-
12-16-22	STP-37	STP	Negative	40cm	Sterile	-
12-16-22	STP-38	STP	Negative	40cm	Sterile	-
12-19-22	STP-39 (at new feature)	STP	Negative	20cm	Hardpan	-
12-19-22	STP-40 (at new feature)	STP	Negative	37cm	Hardpan	-
12-19-22	STP-41 (at new feature)	STP	Negative	40cm	Sterile	-

Only one shovel test unit at CA-RIV-7182 was positive for cultural material – one quartz flake was observed. This unit, STP 30, expands the site boundary to the east by approximately 20 meters. Additionally, surface artifacts and a new bedrock mortar feature were located in the area by ECORP field staff and tribal monitors in the process of placing shovel test units, which expands the boundaries of this site. These artifacts were likely obscured by the orange trees that were present during the last survey of this portion of the Project Area and are now visible on the surface after the disturbance from the removal of the trees. This also suggests that the artifacts observed on the surface are not in situ deposits.

In 2024, ECORP, the Pechanga Band of Indians, the Soboba Band of Luiseño Indians, and Riverside County personnel revisited the site on June 4, 2024 as part of a field visit to the Project. At this time, Pechanga identified a previously undocumented [redacted] within Feature 7, one cupule (3 meters north of Feature 7), a boulder with

several cupules (6 meters south of Feature 7), and a core and a mano fragment [redacted] The site boundary was expanded to include the single cupule and the cupule boulder.

c) P-33-12917/CA-RIV-7183

This site was originally recorded by Dice and Bouscaren in 2003 in the [redacted] of the project area and was described as two bedrock outcrops with at least seven milling slicks on the exposed surface. The original site boundary includes adjacent property [redacted]th, which is outside of the current Project Area. Stone tools and debitage were observed within the vicinity of the milling features. In 2015 (FCS 2015:26), FCS cited that this site could not be relocated, "because of the degradation of the sites by natural erosion factors and orchard maintenance activities." Dice and Bouscaren conducted Phase II testing in 2004 and observed and collected 93 surface artifacts, all of which were groundstone or flaked stone artifacts. One plummet-shaped [redacted], a broken Elko side-notched projectile point, and various pieces of heat-treated chert. Below surface, only 35 quartz flakes and 14 fragments of fire affected rock were collected. Dice and Bouscaren (2004) evaluated the site through subsurface testing and did not find buried intact deposits. The result was Dice and Bouscaren's recommendation that the site does not meet the criteria for inclusion in the CRHR under any criteria.

Since that time, the orchard had been removed, and in 2022, ECORP successfully located the site. ECORP updated site boundaries but did not observe any associated artifacts on the surface. The site has been impacted by the removal of the orange grove previously present in the Project Area.

A total of eight auger tests were performed by ECORP around site CA-RIV-7183 before the testing strategy was amended through consensus of ECORP field staff and the Native American tribal monitors present. The soil in all of the auger tests was loamy sand in varying shades of brown and dark brown, with compaction due to clay deposits or degraded granite deposits present in some. After the initial eight auger tests, field crew commenced excavation of four shovel test units around the site. No cultural strata were observed, so excavation was conducted using arbitrary 20-centimeter levels. Surface soils were reddish or yellowish brown, and compaction varied based on the amount of clay and granite encountered. Some of the surface area around CA-RIV-7183 was disturbed due to previous discing. Results of the augers and shovel testing are shown in Table 4, below.

Table 4. Testing Results for P-33-12917/CA-RIV-7183

Date	Identifier	Unit Type	Results	Depth at Termination	Reason for Termination	Artifacts
12-7-22	7183-A	Auger	Negative	37cm	Bedrock	-
12-7-22	7183-B	Auger	Negative	40cm	Sterile	-
12-7-22	7183-C	Auger	Negative	53cm	Hardpan	-
12-7-22	7183-D	Auger	Negative	40cm	Sterile	-
12-7-22	7183-E	Auger	Negative	40cm	Sterile	-
12-7-22	7183-F	Auger	Negative	40cm	Sterile	-
12-7-22	7183-G	Auger	Negative	40cm	Sterile	-
12-7-22	7183-H	Auger	Negative	5cm	-	-

Table 4. Testing Results for P-33-12917/CA-RIV-7183						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-7-22	STP-1	STP	Positive	40cm	Positive	Shattered quartz at 5cm
12-7-22	STP-2	STP	Positive	40cm	Positive	Shattered quartz at 40cm
12-8-22	STP-3	STP	Negative	40cm	Sterile	-
12-8-22	STP-4	STP	Negative	30cm	Hardpan	-

The eight initial auger tests around and between the two previously recorded bedrock mortar features (A and B) at CA-RIV-7183 were negative for cultural material. After field methods were modified to substitute shovel test units for auger tests, the first two units excavated on the [redacted] side of the site boundary yielded pieces of naturally-occurring shattered quartz. Neither of these pieces were culturally modified and do not represent debitage; however, their presence and importance were noted by tribal representatives.

During testing of this site, a newly identified bedrock mortar slick was observed [redacted] of the site (Feature C). This site is now recognized as being composed of three discrete features. From east to west, these three are shown on the site location map in Appendix C as Features A, B, and a newly identified feature, C. Because testing around and between these features failed to identify indications of archaeological deposits, the site boundaries are limited to the bedrock features themselves and not the space between them.

d) P-33-12918/CA-RIV-7184

This site was originally recorded by Dice and Bouscaren in 2003 in the [redacted] of the project area and was described as three bedrock outcrops with at least 11 milling slicks on the exposed surface. No associated artifacts were noted during the initial recordation. This site was not subjected to Phase II testing by Dice and Bouscaren in 2004, based on their examination of the site and observation that topsoil in the site boundary is extremely thin (2004:36). Dice and Bouscaren (2004) evaluated the site based on survey level data alone and recommended that the site does not meet the criteria for inclusion in the CRHR under any criteria.

The site was revisited by ECORP archaeologists on February 17 and April 1, 2022. The original outcrops with milling features were not relocated; however, a separate bedrock outcrop with at least [redacted] milling slicks was observed [redacted]. The site was located, and updated site boundaries were collected.

No cultural stratigraphy was observed by ECORP in the soil around CA-RIV-7184, so shovel test units were all excavated in arbitrary 20-centimeter levels. The soil was primarily loose loamy sand, with some mildly to heavily compact silty clay loam below 20 centimeters. Soil colors in the test units was brown, reddish brown, and dark yellowish brown. Some vegetation and roots were observed, and there were also deposits of degraded granite. All but two of the test units around CA-RIV-7184 reached a terminal depth of 40 centimeters. Results from testing are listed in Table 5.

Table 5. Testing Results for P-33-12918/CA-RIV-7184						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-8-22	STP-5	STP	Negative	40cm	Sterile	-
12-8-22	STP-6	STP	Negative	36cm	Hardpan	-
12-9-22	STP-7	STP	Negative	40cm	Sterile	-
12-9-22	STP-8	STP	Negative	40cm	Sterile	-
12-9-22	STP-9	STP	Negative	40cm	Sterile	-
12-9-22	STP-10	STP	Negative	39cm	Hardpan	-
12-9-22	STP-11	STP	Negative	40cm	Sterile	-
12-9-22	STP-12	STP	Negative	40cm	Sterile	-
12-9-22	STP-13	STP	Negative	40cm	Sterile	-

Nine total shovel test units were excavated around the outside of the CA-RIV-7184 site boundary. No cultural material was recovered in testing.

This site is now recognized as being composed of five discrete features. [redacted] these five are shown on the site location map in Appendix C as Features A, B, C, D, and E. Because testing around and between these features failed to identify indications of archaeological deposits, the site boundaries are limited to the bedrock features themselves and not the space between them.

e) CA-01

This pre-contact site consists of a bedrock milling feature that was initially recorded in 2022 during the supplemental field surveys for the updated Phase 1 (ECORP 2022). The feature is composed of a deeply embedded granitic boulder with an exposed surface measuring 3.7 meters east to west by 2.8 meters north to south. Three well-formed milling slicks measuring 31 centimeters are located near the center of the boulder. The exposed surface of the feature lies low to the ground with the slicks approximately 20 centimeters above ground surface. A layer of sediment covers large portions of feature that may obscure other milling slicks, and therefore, testing to confirm boundaries was warranted.

Five shovel test units were excavated around the outside of site CA-01. No cultural strata were present, so excavation was conducted in arbitrary 20-centimeter levels. The entire area around the site had been previously disced, so the surface was heavily disturbed. Soil types observed in the areas around the site included loam and silty clay loam in varying tones of reddish and yellowish dark brown. Some small rocks and granite deposits were observed during excavation. Test unit number 14 was terminated due to reaching a buried PVC irrigation pipe that precluded further excavation, with the remainder of units being terminated due to heavily compact soil deposits. Results from the testing at CA-01 are shown in Table 6, below.

Table 6. Testing Results for CA-01						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-13-22	STP-14	STP	Negative	30cm	PVC pipe at 30cm	-
12-13-22	STP-15	STP	Negative	37cm	Hardpan	-
12-13-22	STP-16	STP	Negative	37cm	Hardpan	-
12-13-22	STP-17	STP	Negative	37cm	Hardpan	-
12-13-22	STP-18	STP	Negative	40cm	Hardpan	-

No cultural material was located during testing around CA-01. Therefore, the boundaries of the site as originally recorded did not need to be revised.

f) CA-02

This pre-contact site consists of a bedrock milling feature that was initially recorded in 2022 during the supplemental field surveys for the updated Phase 1 (ECORP 2022). The bedrock milling feature is composed of a large bedrock outcrop measuring 27.35 meters east to west by 39.53 meters north to south. The outcrop contains at least [redacted] milling slicks. [redacted]. Most of the milling slicks are located along the [redacted] side of the outcrop, approximately 30 centimeters above ground surface. A granitic mano was identified embedded in the ground adjacent to the [redacted] edge of the outcrop.

Shovel test units surrounding CA-02 were excavated in arbitrary 20-centimeter levels, as no cultural strata were observed. The entire area around the site had been previously disced, causing substantial surface disturbance. Soil types observed during excavation included silty loam and silty clay loam in varying shades of reddish and yellowish dark brown. Deposits of degraded granite were observed throughout much of the soil, and that combined with clay deposits led to heavy compaction in the soil. Below 20 centimeters, all of the units became much more compact, with some having to be terminated due to this. The results of testing near CA-02 are listed in Table 7.

Table 7. Testing Results for CA-02						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-13-22	STP-19	STP	Negative	32cm	Hardpan	-
12-14 to 12-15-22	STP-20	STP	Negative	31cm	Hardpan	-
12-14-22	STP-21	STP	Negative	40cm	Hardpan	-
12-14-22	STP-22	STP	Negative	30cm	Hardpan	-
12-14-22	STP-23	STP	Negative	40cm	Hardpan	-
12-14-22	STP-24	STP	Negative	40cm	Hardpan	-
12-14-22	STP-25	STP	Negative	20cm	Bedrock	-

Table 7. Testing Results for CA-02						
Date	**Identifier**	**Unit Type**	**Results**	**Depth at Termination**	**Reason for Termination**	**Artifacts**
12-15-22	STP-26	STP	Negative	40cm	Hardpan	-
12-15-22	STP-27	STP	Negative	40cm	Hardpan	-

The recent discing around site CA-02 seems to have disturbed some subsurface cultural deposits, leading to multiple mano and metate fragments around the outside of the site. These resources were observed in the process of deciding placement of shovel test units around the site. Because of this, the site boundary had to be revised to include these resources, so shovel test units were placed at least five meters further from the site boundary than any surface resources were located. Nine test units in total were placed around CA-02, and no cultural material was observed in any. Therefore, revisions of the site boundary were required only to accommodate surface artifacts and bedrock feature but excluded the locations of the shovel test units.

g) CA-04

This precontact site consists of a bedrock milling feature. The feature is a granite outcrop measuring 6.5 meters southeast to northwest by 3 meters southwest to northeast and is 2 meters tall at its highest point. The outcrop contains two basins and three slicks. [redacted]. This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

h) CA-05

This precontact site is a bedrock milling feature. The feature is a bedrock outcrop measuring 1.9 meters north to south by 5 meters east to west and is 31 centimeters above ground surface at its highest point. The outcrop contains two slicks. The surface of the outcrop is heavily weathered and friable. This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

i) CAR-08

This precontact site is a bedrock milling feature. The feature is a granite outcrop measuring 2.47 meters north to south by 1.09 meters east to west and it is 0.5 meters above ground surface at its highest point. The outcrop contains one slick. [redacted] This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

j) CAR-09

This precontact site is a bedrock milling feature. The feature is granite outcrop measuring 2.95 meters northwest to southeast by 1.03 meters northeast to southwest and it is 0.63 meters above ground surface at its highest point. The outcrop contains two milling slicks. The surface of the outcrop is weathered and it is partially covered by vegetation. [redacted] This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

k) CAR-10

This precontact site is a bedrock milling feature. The feature is a granite outcrop measuring 3.58 meters north to south by 1.78 meters east to west and it is 0.54 meters above ground surface at its highest point. The outcrop contains one basin. The surface of the outcrop exhibits weathering and crustose lichens are growing on one-quarter of the exposed surface area. This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

l) CAR-11

This precontact site is a bedrock milling feature. The feature is a bedrock outcrop measuring 2.24 meters north to south by 2.3 meters east to west and it is 2.12 meters above ground surface at its highest point. The outcrop contains one slick. [redacted]. This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

m) CAR-12

This precontact site consists of a bedrock milling feature. The bedrock milling feature is composed of a partially embedded granitic boulder outcrop. Two milling slicks are present on one boulder (west) and one is present on a separate boulder (east). This site was located after the completion of the Phase II testing for the project and was not subject to subsurface testing.

n) CAR-13-I

This precontact isolate consists of a unifacial granite mano. The resource was identified [redacted]

VII. SIGNIFICANCE

Each of the pre-contact archaeological sites inside the Project Area must be evaluated for significance based on the whole of the record, which is composed of the 2022 Phase II testing (reported herein), all previous archaeological research by Dice and Bouscaren (2004) and FCS (2015), and tribal consultation between the County and culturally affiliated Native American tribes. Should the tribes offer additional information to the County during consultation regarding significance or identification, the County will take that into account when making the final determinations of eligibility or may determine that any of these sites are tribal cultural resources (as defined in Section 21074 of the Public Resources Code), regardless of NRHP- or CRHR-eligibility.

The eligibility criteria for the NRHP are as follows (36 CFR 60.4): "The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) that have yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Effects to NRHP-eligible resources (historic properties) are adverse if the project may alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Separately, under State law (CEQA), cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the sites are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

A Historical Resource is a resource that:

1. is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission;
2. is included in a local register of historical resources, as defined in PRC 5020.1(k);
3. has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g); or
4. is determined to be historically significant by the CEQA lead agency CCR Title 14, § 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

The eligibility criteria for the CRHR (CCR Title 14, § 4852(b)) state that a resource is eligible if:

1. it is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. it is associated with the lives of persons important to local, California, or national history.
3. it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. it has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, § 4852(c)). Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, § 15064.5(a)).

a) P-33-12915/CA-RIV-7181

Fifteen STPs were excavated at this site in December 2022. Six pre-contact flakes were observed in 4 of the STPs at depths between 17 and 38 cm below surface. The flakes were observed among homogenous or previously disturbed sediments along the site's western periphery. The majority of the site lies outside of the project footprint [redacted] and was not subjected to testing. Although the 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV, prior research by Dice and Bouscaren (2004) and FCS (2015) demonstrates that this site possesses the potential to yield important information in pre-contact history ("prehistory"). The types of lithic materials reported by these previous studies suggests that the site could possess archaeological data to address research questions regarding activities and site function, subsistence patters, technology, trade interactions, and possibly chronology and temporal patterns. As a result, this site is eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4.

No information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

The majority of this site [redacted] Although soils are not likely to possess substantial depth, the soils that do exist are largely undisturbed [redacted]. Based on site descriptions from Dice and Bouscaren (2004), [redacted] the site appears to retain sufficient integrity of materials, location, and (for the bedrock features) workmanship. These aspects of integrity are most important in conveying the significance of the site under NRHP/CRHR Criterion D/4 because in situ archaeological data is necessary to answer the research themes noted above.

Because site P-33-12915/CA-RIV-7181 is eligible for the NRHP and CRHR under criteria D and 4, respectively, and because it retains sufficient integrity, this site is considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

b) P-33-12916/CA-RIV-7182

Fourteen STPs were excavated at this site in December 2022. One pre-contact flake was observed in 1 of the STPs within the top 20cm of the unit. The flake were observed among homogenous or previously disturbed sediments along the [redacted]. The majority of the site lies outside of the project footprint [redacted] and was not subjected to testing. Although the 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV, prior research by Dice and Bouscaren (2004) and FCS (2015) demonstrates that this site possesses the potential to yield important information in pre-contact history ("prehistory"). The types of lithic materials reported by these previous studies suggests that the site could possess archaeological data to address research questions regarding activities and site function,

subsistence patters, technology, trade interactions, and possibly chronology and temporal patterns. As a result, this site is eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4.

No information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

A portion of this site [redacted]. Although soils within the drainage are not likely to possess substantial depth, the soils that do exist [redacted] undisturbed. Based on site descriptions from Dice and Bouscaren (2004), the site appears to retain sufficient integrity of materials and location and (for the bedrock features) workmanship. These aspects of integrity are most important in conveying the significance of the site under NRHP/CRHR Criterion D/4 because in situ archaeological data is necessary to answer the research themes noted above.

Because site P-33-12916/CA-RIV-7182 is eligible for the NRHP and CRHR under criteria D and 4, respectively, and because it retains sufficient integrity, this site is considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

c) P-33-12917/CA-RIV-7183

Eight augers and 4 STPs were excavated at this site in December 2022. Only shattered naturally occurring quartz was observed in 2 of the STPs between 5 and 40cm below surface. Otherwise, all units were culturally sterile. The 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV. Prior research by Dice and Bouscaren (2004) and FCS (2015) demonstrates that this site previously yielded surface artifacts, but all were on the surface and in a heavily disturbed context. Previous subsurface testing by Dice and Bouscaren failed to yield any subsurface deposits, which is consistent with the 2022 testing results.

The absence of in situ archaeological data means that the site does not possess the potential to yield important information or address research questions presented above. As a result, this site is not eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4. In addition, no information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

Because site P-33-12917/CA-RIV-7183 is not eligible for the NRHP and CRHR under any criteria, this site is not considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

d) P-33-12918/CA-RIV-7184

Nine STPs were excavated at this site in December 2022. All units were culturally sterile. The 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV. Prior research by Dice and Bouscaren (2004) and FCS (2015) demonstrates that this site previously failed to yield any artifacts, which is consistent with the 2022 testing results.

The absence of in situ archaeological data means that the site does not possess the potential to yield important information or address research questions presented above. As a result, this site is not eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4. In addition, no information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

Because site P-33-12918/CA-RIV-7184 is not eligible for the NRHP and CRHR under any criteria, this site is not considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

e) CA-01

Five STPs were excavated at this site in December 2022. All units were culturally sterile. The 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV.

The absence of in situ archaeological data means that the site does not possess the potential to yield important information or address research questions presented above. As a result, this site is not eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4. In addition, no information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

Because site CA-01 is not eligible for the NRHP and CRHR under any criteria, this site is not considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

f) CA-02

Nine STPs were excavated at this site in December 2022. All units were culturally sterile. The 2022 testing efforts failed to yield sufficient data that could be used to address the research themes and questions presented in Section IV.

The absence of in situ archaeological data means that the site does not possess the potential to yield important information or address research questions presented above. As a result, this site is not eligible for inclusion in the NRHP under Criterion D and CRHR under Criterion 4. In addition, no information could be located in the archival record to indicate that this site is associated with important events or persons in history or pre-contact history and therefore, this site is not eligible for inclusion in the NRHP under Criteria A or B or CRHR under Criteria 1 or 2. This site also does not embody the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values, and as such, is not eligible for inclusion in the NRHP under Criterion C or CRHR under Criterion 3.

Because site CA-02 is not eligible for the NRHP and CRHR under any criteria, this site is not considered a historical resource under CEQA and a historic property under Section 106. Recommendations for management of this resource as part of the proposed development are provided in Section VIII.

g) CA-04

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

h) CA-05

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

i) CAR-08

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

j) CAR-09

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

k) CAR-10

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

l) CAR-11

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

m) CAR-12

This precontact site consists of a bedrock milling feature that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

n) CAR-13-I

This precontact isolate consists of a unifacial granite mano that was located after the completion of the Phase II testing for the project and was not subject to subsurface testing. ECORP recommends that this site be treated as eligible for the purpose of this project.

o) Summary

The results of the testing performed under the County-approved testing plan, and in consideration of the previous research performed on the property, indicate the following.

Table 8. Summary of Evaluation Recommendations

Site	NRHP A / CRHR 1	NRHP B / CRHR 2	NRHP C / CRHR 3	NRHP D / CRHR 4
P-33-12915 (CA-RIV-7181)	Not eligible	Not eligible	Not eligible	Eligible
P-33-12916 (CA-RIV-7182)	Not eligible	Not eligible	Not eligible	Eligible
P-33-12917 (CA-RIV-7183)	Not eligible	Not eligible	Not eligible	Not eligible
P-33-02918 (CA-RIV-7184)	Not eligible	Not eligible	Not eligible	Not eligible
CA-01	Not eligible	Not eligible	Not eligible	Not eligible
CA-02	Not eligible	Not eligible	Not eligible	Not eligible
CA-04	Treat as eligible for the purpose of this project			
CA-05	Treat as eligible for the purpose of this project			
CAR-08	Treat as eligible for the purpose of this project			
CAR-09	Treat as eligible for the purpose of this project			
CAR-10	Treat as eligible for the purpose of this project			
CAR-11	Treat as eligible for the purpose of this project			
CAR-12	Treat as eligible for the purpose of this project			
CAR-13-I	Treat as eligible for the purpose of this project			

As summarized above, only two of the six archaeological sites present within the project area are significant on an individual level because they possess sufficient archaeological data to address research themes and questions presented further above. Four sites do not meet the criteria for inclusion in the NRHP or CRHR; however, when viewing the project area as a whole, the presence of multiple bedrock mortar features (even those without associated archaeological deposits) suggests that the local area was heavily occupied in pre-contact times. The

spatial distribution of sites loosely conforms to the orientation and path of a drainage corridor that bisects the project area. The remaining eight sites were not subject to testing and cannot be evaluated by surface-level data alone, and therefore ECORP recommends that they be treated as eligible for the purpose of this project.

Given the nearly universal association between water features and human occupation, it stands to reason that the pre-contact occupation of the project area focused on the drainage corridor and that smaller resource processing localities flanked each side. There currently does not exist sufficient archaeological data to test such a theory or determine whether or not there is a temporal and functional association between these six sites. Therefore, calling it a district or cultural landscape may be premature, but the importance of the bedrock features themselves to modern descendant communities is well understood. The remaining value of the non-eligible sites is the bedrock outcrops themselves, even though they do not rise to the level of significance established by the NRHP and CRHR criteria. Tribal consultation between the County and culturally affiliated tribes has let to the determination that all of the pre-contact sites, regardless of archaeological significance, constitute a tribal cultural landscape that meets the definition of a tribal cultural resource under CEQA. The following section offers recommendations for management of the resources on the property.

VIII. IMPACT ASSESSMENT

The results of the inventory and Phase II testing program led to additional changes to project design to increase preservation in place to the greatest extent feasible.

Avoidance and preservation in place can be defined in several ways. Horizontal avoidance is defined as the pulling back of project elements and putting into place measures such as exclusionary fencing, taking advantage of natural topographic barriers, or deed restrictions (or a combination thereof) to ensure that activity during construction or use of the completed project does not encroach into the area of avoidance.

Avoidance can also be achieved by creating a vertical separation between the resource and project activity. This is often accomplished by engineered capping, especially in areas of planned fill or non-structural and above-ground infrastructure is necessary. The method of capping and the thickness of the soil cap varies from site to site but is generally composed of a combination of geotextile fabric or geogrid over the site surface, followed by layers of soil or sand fill, above which landscaping, trails, recreation areas, or access roads can be constructed. The use of capping must be accompanied by a deed restriction to ensure that future project activity does not penetrate the geogrid and impact the resource.

Appendix E provides a map showing the areas proposed for avoidance and a map showing the proposed fencing plan. Table 9, below, summarizes and quantifies the avoidance. Collectively, the sites and features identified on the property total approximately 16.39 acres. Of this, 14.66 acres will be preserved in place through horizontal avoidance and placement into open space, which constitutes almost 90 percent of the cultural resources area. This number increases to just over 90 percent when considering Feature E of CA-RIV-7184 and CAR-12 will be capped in place. Approximately 10 percent of the cultural resource areas cannot be preserved in place because of the need for infrastructure, ingress/egress, and engineering constraints.

Table 9. Summary of Effect

Site	Eligibility	Project Impact	Remarks
P-33-12915 (CA-RIV-7181)	Eligible	0.610 ac	95% of the site will be preserved in place; no bedrock milling features will be affected
P-33-12916 (CA-RIV-7182)	Eligible	0.970 ac	75% of the site will be preserved in place; bedrock milling features A, B, C, and D are included in the 25% of the site that will be impacted, but the rest of the features will be preserved in place
P-33-12917 (CA-RIV-7183) – Feature A	Not eligible	0	100% of the site will be preserved in place
P-33-12917 (CA-RIV-7183) – Feature B	Not eligible	0	100% of the site will be preserved in place
P-33-12917 (CA-RIV-7183) – Feature C	Not eligible	0	100% of the site will be preserved in place
P-33-02918 (CA-RIV-7184) – Feature A	Not eligible	0	100% of the site will be preserved in place
P-33-02918 (CA-RIV-7184) – Feature B	Not eligible	0.010 ac	-
P-33-02918 (CA-RIV-7184) – Feature C	Not eligible	0.030 ac	-
P-33-02918 (CA-RIV-7184) – Feature D	Not eligible	0.010 ac	-
P-33-02918 (CA-RIV-7184) – Feature E	Not eligible	0.090 ac	This feature will be capped, thereby providing vertical separation between the resource and post-construction use
CA-01	Not eligible	0.002 ac	-
CA-02	Not eligible	0	100% of the site will be preserved in place
CAR-04	Eligible	0.004 ac	-
CAR-05	Eligible	0.003 ac	-
CAR-08	Eligible	0.0005 ac	-
CAR-09	Eligible	0	100% of the site will be preserved in place
CAR-10	Eligible	0.001 ac	-
CAR-11	Eligible	0	100% of the site will be preserved in place
CAR-12	Eligible	0	This feature will be capped, thereby providing vertical separation between the resource and post-construction use
CAR-13-I	Eligible	0.00002 ac	-
	Total	1.73 ac	

IX. RECOMMENDED MITIGATION

Mitigation measures or conditions of approval will ensure preservation in place of 90 percent of the cultural resources and address any unanticipated discoveries during construction. Table 10 summarizes the treatment for each site.

Table 10. Summary of Treatment												
Site	Treatment											
	A	B	C	D	E	F	G	H	I	J	K	L
P-33-12915 (CA-RIV-7181)	X	-	-	-	X*	-	X	X	X*	X*	X	X
P-33-12916 (CA-RIV-7182) – Feature A	X	-	X	X	-	X	X	X	-	-	X	X
P-33-12916 (CA-RIV-7182) – Feature B	X	-	X	X	-	X	X	X	-	-	X	X
P-33-12916 (CA-RIV-7182) – Feature C	X	-	X	X	-	X	X	X	-	-	X	X
P-33-12916 (CA-RIV-7182) – Feature D	X	-	X	X	-	X	X	X	-	-	X	X
P-33-12916 (CA-RIV-7182) – Balance of Site	X	-	-	-	X	-	X	X	X	X	X	X
P-33-12917 (CA-RIV-7183) – Feature A	X	-	-	-	X	-	X	X	X	X	X	X
P-33-12917 (CA-RIV-7183) – Feature B	X	-	-	-	X	-	X	X	X	X	X	X
P-33-12917 (CA-RIV-7183) – Feature C	X	-	-	-	X	-	X	X	X	X	X	X
P-33-02918 (CA-RIV-7184) – Feature A	X	-	-	-	X	-	X	X	X	X	X	X
P-33-02918 (CA-RIV-7184) – Feature B	X	-	X	X	-	X	X	X	-	-	X	X
P-33-02918 (CA-RIV-7184) – Feature C	X	-	X	X	-	X	X	X	-	-	X	X
P-33-02918 (CA-RIV-7184) – Feature D	X	-	X	X	-	X	X	X	-	-	X	X
P-33-02918 (CA-RIV-7184) – Feature E	X	X	X	X	-	X	X	X	-	-	X	X
CA-01	X	-	X	X	-	X	X	X	-	-	X	X
CA-02	X	-	-	-	X	-	X	X	X	X	X	X
CAR-04	X	-	X	X	-	X	X	X	-	-	X	X
CAR-05	X	-	X	X	-	X	X	X	-	-	X	X
CAR-08	X	-	X	X	-	X	X	X	-	-	X	X
CAR-09	X	-	-	-	X	-	X	X	X	X	X	X
CAR-10	X	-	X	X	-	X	X	X	-	-	X	X
CAR-11	X	-	-	-	X	-	X	X	X	X	X	X
CAR-12	X	X	-	-	-	-	X	X	-	-	X	X
CAR-13-I	X	-	X	X	-	-	X	X	-	-	X	X

*This treatment pertains to a portion of the resource, as illustrated in Appendix E

Prior To Grading Permit Issuance

a) 060 - Planning-CUL. 1 Cultural Sensitivity Training

The County shall ensure that a worker awareness training program is developed and delivered to train the Contractor's equipment operators and the Project's field consultants about tribal cultural resources and the requirements for avoidance and minimization. The program shall inform workers about the following topics: federal and state regulations pertaining to cultural resources and tribal cultural resources; the presence of ESAs that are restricted from all Project-related activities; the requirement for ground-disturbing activities near the ESAs to be monitored by a Tribal Monitor; the subsurface indicators of resources that shall require a work stoppage; procedures for notifying the County and, if necessary, the coroner, of any occurrences; confidentiality requirements; appropriate and respectful behavior when in the presence of tribal cultural resources; maintaining a harassment-free and safe work environment for monitors; and enforcement of penalties and repercussions for non-compliance with the program.

The County shall offer the opportunity to consulting tribes to provide content for the training program. The training shall be given first to construction supervisors and may be recorded. The construction supervisors are responsible for ensuring that all workers that will operate ground-disturbing equipment receive this training prior to operating equipment that will disturb original ground. All trained workers will be required to receive a brochure and hardhat sticker and sign a form indicating their understanding of the requirements and restrictions and copies of the forms shall be provided to the County as proof of compliance. Materials and supplies delivery drivers, above-ground construction workers (i.e., framers, carpenters, electricians, plumbers, painters, and roofers) are not required to receive the training because the type of specialized activities that they will perform does not have the potential to disturb cultural resources or tribal cultural resources.

b) 060 - Planning-CUL. 2 Capping

The bedrock milling feature at cultural site(s) Feature E of site P-33-02918 (CA-RIV-7184) and CAR-12 cannot be avoided unless vertical separation between the feature and project construction can be ensured. To address capping in this area, a plan will be developed and included in the CRMP by the Project Archaeologist. The capping plan shall specify the thickness of the soil cap, the combination of geotextile fabric or geogrid over the site surface, and composition of layers of soil or sand fill, above which landscaping, trails, recreation areas, or access roads can be constructed. Results of the capping shall be included in the Phase IV monitoring report.

c) 060 - Planning-CUL. 3 Controlled Grading

The bedrock milling features at cultural site(s) P-33-002918 (CA-RIV-7184) Features B, C, D, E, P-33-12916 Features A, B, C, D, CA-01, CAR-04, CAR-05, CAR-08, CAR-10, and CAR-13-I will be impacted during construction activities and the soils surrounding them will be disturbed. To address controlled grading in this area, a plan will be developed and included in the CRMP by the Project Archaeologist. The controlled grading plan shall require the systematic removal of the ground surface to allow for the identification, documentation and recovery of any subsurface cultural deposits. Results of the controlled grading program shall be included in the Phase IV monitoring report.

d) 060 - Planning-CUL. 4 ECS Sheet- Resource Relocation and Reburial Area

Prior to issuance of grading permits: the developer/ applicant shall provide evidence to the Riverside County Planning Department that an Environmental Constraints Sheet has been included in the Grading Plans. This sheet shall indicate an area to be used for relocation of the bedrock milling features that cannot be avoided by this project. In addition, a permanent space within this area will be predetermined and designated on a confidential map for reburial of any artifacts that will be impacted and/or discovered during grading.

e) 060 - Planning-CUL. 5 ECS Sheet

Prior to final map approval the developer/ applicant shall provide evidence to the Riverside County Planning Department that an Environmental Constraints Sheet has been included in the Grading Plans. This sheet shall indicate the presence of environmentally constrained area(s) and the requirements for avoidance of portions of P-33-012915 (CA-RIV-7181), portions of P-33-012916 (CA-RIV-7182), P-33-012917 (CA-RIV-7183) Features A, B and C, P-33-02918 (CA-RIV-7184) Feature A, CA-02, CAR-09, and CAR-11.

f) 060 - Planning-CUL. 6 Feature Relocation

Site(s) P-33-002918 (CA-RIV-7184) Features B, C, D, P-33-12916 (CA-RIV-7182) Features A, B, C, D, CA-01, CAR-04, CAR-05, CAR-08, and CAR-10 cannot be avoided through Project redesign. Prior to grading permit issuance, the Project Supervisor and Project Archaeologist and a representative from the consulting Tribe(s) shall meet onsite to determine the strategy for relocating the milling features to a permanent open space area predetermined and designated on a confidential map. Before construction activities are allowed to start and using professional archaeological methods, any visible artifacts shall be recovered and recorded, photo documentation of each feature in situ shall occur. The current Department of Parks and Recreation forms for the sites shall be updated, detailing which features were relocated, the process through which this was done, and updated maps using sub meter GIS technology to document the new location of each feature. The relocation information shall be included in the Phase IV Monitoring Report.

g) 060 - Planning-CUL. 7 Native American Monitor

Prior to the issuance of grading permits, the developer/permit applicant shall enter into agreement(s) with the consulting tribe(s) for the appropriate number of Native American Monitor(s). In conjunction with the Archaeological Monitor(s), the Native American Monitor(s) shall attend the pre-grading meeting with the contractors to provide Cultural Sensitivity Training for all construction personnel. In addition, an adequate number of Native American Monitor(s) shall be on-site during all initial ground disturbing activities and excavation of soils in each portion of the project site including clearing, grubbing, tree removals, grading and trenching. In conjunction with the Archaeological Monitor(s), the Native American Monitor(s) have the authority to temporarily divert, redirect or halt the ground disturbance activities to allow identification, evaluation, and potential recovery of cultural resources. Activities will be documented in Tribal Monitoring Notes which will be required to be submitted to the County Archaeologist prior to grading final inspection. The developer/permit applicant shall submit a fully executed copy of the agreement(s) to the County

Archaeologist to ensure compliance with this condition of approval. Upon verification, the Archaeologist shall clear this condition. This agreement shall not modify any condition of approval or mitigation measure.

h) 060 - Planning-CUL. 8 Project Archaeologist

Prior to issuance of grading permits: The applicant/developer shall provide evidence to the County of Riverside Planning Department that a County certified professional archaeologist (Project Archaeologist) has been contracted to implement a Cultural Resource Monitoring Program (CRMP). A Cultural Resource Monitoring Plan shall be developed that addresses the details of all activities and provides procedures that must be followed in order to reduce the impacts to cultural, tribal cultural and historic resources to a level that is less than significant as well as address potential impacts to undiscovered buried archaeological resources associated with this project. A fully executed copy of the contract and a digitally-signed copy of the Monitoring Plan shall be provided to the County Archaeologist to ensure compliance with this condition of approval.

Working directly under the Project Archaeologist, an adequate number of qualified Archaeological Monitors shall be present to ensure that all earth moving activities are observed and shall be on-site during all grading activities for areas to be monitored including off-site improvements. Inspections will vary based on the rate of excavation, the materials excavated, and the presence and abundance of artifacts and features.

The Professional Archaeologist may submit a detailed letter to the County of Riverside during grading requesting a modification to the monitoring program if circumstances are encountered that reduce the need for monitoring.

i) 060 - Planning-CUL. 9 Temporary Fencing

Temporary fencing shall be required for the protection of cultural site(s) portions of P-33-012915, portions of P-33-012916 (CA-RIV-7182), P-33-012917 (CA-RIV-7183) Features A, B and C, P-33-02918 (CA-RIV-7184) Feature A, CA-02, CAR-09, and CAR-11 during grading activities. Prior to commencement of grading or brushing, the project archaeologist shall confirm the site boundaries and determine an adequate buffer for protection of the site(s). The applicant shall direct the installation of fencing under the supervision of the project archaeologist and Native American Monitor. The fencing can be removed only after grading operations have been completed.

Prior To Grading Final Inspection

j) 070 - Planning-CUL. 1 Deed Restrictions

At the conclusion of all construction activities, the Project proponent and landowner shall record a deed restriction on the avoidance areas (and the reburial location, if used) with the County to restrict development of the ESAs in the future. Deed restrictions shall not disclose the nature of the ESAs. A copy of the deed restriction(s) shall be submitted to the County planning staff as proof of compliance prior to the issuance of certificates of occupancy for the Project.

Required Notifications

The following notifications are included as part of the recommendation of approval for TTM38510. They are intended to advise the applicant of various Federal, State and County regulations applicable to this entitlement and the subsequent development of the subject property.

k) Planning-CUL. 1 Human Remains

If human remains are found on this site, the developer/permit holder or any successor in interest shall comply with State Health and Safety Code Section 7050.5.

l) Planning-CUL. 2 Unanticipated Resources

The developer/permit holder or any successor in interest shall comply with the following for the life of this permit. If during ground disturbance activities, unanticipated cultural resources* are discovered, the following procedures shall be followed:

All ground disturbance activities within 100 feet of the discovered cultural resource shall be halted and the applicant shall call the County Archaeologist immediately upon discovery of the cultural resource. A meeting shall be convened between the developer, the project archaeologist**, the Native American tribal representative (or other appropriate ethnic/cultural group representative), and the County Archaeologist to discuss the significance of the find. At the meeting with the aforementioned parties, a decision is to be made, with the concurrence of the County Archaeologist, as to the appropriate treatment (documentation, recovery, avoidance, etc.) for the cultural resource. Resource evaluations shall be limited to nondestructive analysis. Further ground disturbance shall not resume within the area of the discovery until the appropriate treatment has been accomplished.

* A cultural resource site is defined, for this condition, as being a feature and/or three or more artifacts in close association with each other.

** If not already employed by the project developer, a County approved archaeologist shall be employed by the project developer to assess the significance of the cultural resource, attend the meeting described above, and continue monitoring of all future site grading activities as necessary.

Tribal Cultural Landscape

Tribal consultation between the County and culturally affiliated tribes has identified the presence of a tribal cultural landscape that is considered a tribal cultural resource for the purpose of CEQA. This is independent of the archaeological findings of significance. An impact assessment and determination of additional appropriate mitigation for any impacts will be discussed separately in the CEQA document.

X. CERTIFICATION

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this archaeological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Prepared by: _____ Date _____

Lisa Westwood, RPA

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A. Project Plans and Maps

B. Photographs and Photo Record

C. Site Location Map (CONFIDENTIAL)

D. DPR Site Records (CONFIDENTIAL)

E. Impact Map and Fencing Plan (CONFIDENTIAL)

Report Date: June 2023
Field Work Dates: June 2023

Phase II Cultural Resources Assessment (Architectural History) for the Arroyo Vista Project, Unincorporated Riverside County, California

U.S. Geological Survey 7.5-minute Quadrangles: Riverside East (1967, photorevised 1979)

Parcel Information: APNs 245-300-001, 245-300-004

Prepared on Behalf of: Owner/Applicant:

TTLC Riverside Chicago, LLC
4350 Von Karman Ave, Suite 200
Newport Beach, CA 92660
(949) 261-7010

Prepared For:

County of Riverside, Planning Department
4080 Lemon Street, 9th Floor
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Prepared By:

ECORP Consulting, Inc.
215 N. Fifth Street
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Principal Investigator Nathan Hallam (916) 782-9100
Under the direction of County-approved archaeologist Lisa Westwood (714) 648-0630

Keywords: Riverside County, 15701 Chicago Avenue, Building

Results: Evaluation of residence at 15701 Chicago Avenue; not eligible for inclusion in NRHP/CRHR

Report Preparers: Nathan Hallam (916) 782-9100

Field Personnel: Robert Cunningham (Field Director) (909) 307-0046

MANAGEMENT SUMMARY

a) Purpose of Investigation

TTLC Riverside Chicago, LLC proposes to develop the Arroyo Vista Project on two parcels located at 15701 Chicago Avenue in Riverside County, near the unincorporated community of Woodcrest. The Assessor's Parcel Numbers (APN) for the two properties included in the Project Area are 245-300-001 and 245-300-004. The total Project Area contains 140 acres of land.

The Project Area includes one historic-era residence located at 15701 Chicago Avenue (AV-01). Because of conflicting public information about the construction date of the residence, ECORP implemented a Phase II evaluation of it in May 2023.

b) Major Findings

Through research and fieldwork conducted on June 15, 2023, ECORP concluded that AV-01 remains extant and exceeds 50 years of age. To qualify as a historic property under Section 106 of the National Historic Preservation Act (NHPA), buildings, structures, and objects must exceed 50 years of age, except in exceptional circumstances (36 Code of Federal Regulations [CFR] 60.4).

c) Summary of Significance

ECORP determined that AV-01 does not meet any of the criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historic Resources (CRHR).

d) Summary of Recommendations

Because AV-01 is not eligible for inclusion in the NRHP or CRHR, it does not qualify as a historic property under Section 106 of the NHPA and does not qualify as a historical resource under the California Environmental Quality Act (CEQA).

Under Section 106 of the NHPA, ECORP recommends a finding of No Historic Properties Affected.

Under CEQA, ECORP recommends a finding of No Impact.

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LIST OF ACRONYMS AND ABBREVIATIONS

Term	Definition
Caltrans	California Department of Transportation
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CRHR	California Register of Historical Resources
DPR	Department of Parks and Recreation
ECORP	ECORP Consulting, Inc.
FCS	First Carbon Solutions
NAHC	Native American Heritage Commission
NHPA	National Historic Preservation Act
NRHP	National Register of Historic Places
PRC	Public Resources Code

I. INTRODUCTION AND SETTING

a) Project Description

The Arroyo Vista Project is located on parcels APN 245-300-001 and 245-300-004 at 15701 Chicago Avenue in Riverside County, near the unincorporated community of Woodcrest. TTLC Riverside Chicago, LLC proposes to construct a residential development on approximately 140 acres. The Proposed Project includes the construction of single-family residential lots, open space and preserve areas, trails, parks, water quality basins, and associated infrastructure such as roads, sidewalks, water and sewer lines, and utilities.

Project construction will entail grubbing, clearing, grading, trenching, and excavation within the development footprint. The exceptions include the open space channel that is oriented northwest to southeast through the approximate center of the Project Area—this area will remain largely untouched.

b) Project Location

The Project Area is located within the unincorporated community of Woodcrest in Riverside County, south of Twin Lakes Drive, north of Iris Avenue, west of Chicago Avenue, and east of an unnamed, unpaved road connecting Iris Avenue to Ridge Canyon Drive.

c) U.S. Geological Survey Quad Location

As shown on the U.S. Geological Survey 7.5-minute Riverside East, California topographic quadrangle map (1967, photorevised 1980), the Project Area is in Section 24 of Township 3 South, Range 5 West of the San Bernardino Base and Meridian. The location is shown in Appendix A.

d) Field Personnel

Field personnel consisted of ECORP archaeologist Robert Cunningham. Nathan Hallam served as the principal investigator responsible for oversight of the fieldwork. All work was overseen by Lisa Westwood, who is a County-approved archaeologist working under a Memorandum of Understanding with the County.

Robert Cunningham has 17 years of experience in cultural resources management, with an emphasis on the recording, analysis, and evaluation of historic-period resources. He has participated in all aspects of archaeological fieldwork, including survey, test excavation, and construction monitoring, and has documented numerous types of buildings and structures for architectural history evaluations. He has served as Field Director for archaeological inventories and site evaluation projects. He has recorded and mapped and described historic buildings, schools, ranch houses, and homesteads, along with numerous pre-contact and historic-period archaeological sites and has identified and documented hundreds of pre-contact and historic artifacts. Mr. Cunningham has prepared numerous archaeological site records and has authored and contributed to a variety of cultural resources technical reports.

Dr. Nathan Hallam is a Senior Architectural Historian with 18 years of experience in historic preservation, cultural resources management, and academic teaching. He has extensive experience preparing historic contexts, conducting field surveys, and using National Register criteria to evaluate historic properties. He holds a Ph.D. in History, a Master of Arts in History (Public History), and a Bachelor of Arts in History, and he meets the Secretary of the Interior's Professional Qualification Standards for History, Architectural History, and Historic Preservation. He serves as principal investigator for all architectural history components of projects and is well versed in the

practical application of the laws and regulations of Section 106 of the National Historic Preservation Act (NHPA) and California Environmental Quality Act (CEQA). He has extensive experience working in Certified Local Government historic preservation settings and has carried out multiple historic preservation planning projects in western states. He is highly skilled at historical research and has conducted research in libraries and archives in western states and in Washington, D.C. In addition to completing architectural site documentation for buildings and structures, He has completed National Register Nominations and prepared interpretive panels and narrative histories to mitigate adverse effects under Section 106.

e) Previous Work from Phase I Survey

In 2015, First Carbon Solutions (FCS) conducted a Phase I Cultural Resources Assessment in support of the Riverside Chicago Avenue Project. The FCS 2015 report summarizes the results of the Phase I study that covered 120 acres of the current Project Area. ECORP Consulting, Inc. conducted an update to the 2015 Phase I study in 2022. The original Phase I studies included archaeological review and assessment but did not include evaluation of buildings or structures. This Phase II study includes an evaluation of the residence at 15701 Chicago Avenue but does not include any further archaeological analysis. Below is a brief summary of the archaeological assessments that have been completed, as they pertain to the overall study.

Between December and April 2021, ECORP requested a cultural resources records search from the Eastern Information Center (University of California, Riverside). The records search indicated that 55 cultural resources investigations have been conducted within the 1-mile records search radius between 1974 and 2016. Of these studies, two investigations overlapped the Project Area, covering more than 95 percent of the area. The records search also showed that four cultural resources have been recorded within or adjacent to the Project Area. A total of 105 previously recorded cultural resources are located within 1 mile of the Project Area.

f) Topographic Description and Elevation

The Project Area is in western Riverside County, near the unincorporated community of Woodcrest, approximately 7.39 miles east of the City of Norco, 5.09 miles northwest of the City of Perris, and 0.5 mile south of the City of Riverside. The Project Area is situated at an elevation of 1,403 feet above mean sea level and is in the Mead Valley, east of the Santa Ana Mountains and west of the San Jacinto Mountains in Southern California. The San Bernardino Mountains are to the north. Local topography is undulating terrain crossed by seasonal arroyos. The climate of the Project Area is somewhat comparable to the high deserts of Southern California, though with a more moderate coastal temperature range than the inland deserts.

g) Disturbance and Present Land Use

The Project Area consists of a residence set within a former orchard. Aerial photographs indicate that the Project Area remained undeveloped land through 1962. Aerial photographs taken in 1963 show a residence and saplings forming the basis of an orchard. Recent aerial photography indicates that the orchard remained extant though August 2019 but has since been cleared.

II. HISTORIC CONTEXT

The first Viceroy of New Spain, Antonio de Mendoza, commissioned the maritime explorer Hernando de Alarcón to chart the Gulf of California and Colorado River in 1540. Alarcón and his crew became the first Europeans to reach Alta (Upper) California when they set foot on the banks of the Colorado River in what is now Imperial

County. In 1542, Juan Rodriguez Cabrillo sailed north up the Pacific coast from Mexico in search of the Strait of Anián. Cabrillo and his crew, the first Europeans to explore the Alta California coast, visited San Diego Bay, Santa Catalina Island, and San Pedro Bay, and may have reached as far north as Point Reyes (Starr 2005). Spanish colonization of Alta California began in 1769 with the Portolá land expedition. Led by Captain Gaspar de Portolá and Father Junipero Serra, the expedition proceeded north from San Diego on foot to the Santa Clara Valley. Spain subsequently established a string of 21 Franciscan missions, 4 presidios (forts), and 4 pueblos (towns) in coastal regions of Alta California (Starr 2005).

The Republic of Mexico achieved independence from Spain in 1821. A year later, Alta California became a territory of Mexico with its capital at Monterey. During the 1830s the Mexican government confiscated mission lands and expelled Alta California's Franciscan friars. Former mission lands became granted to retired soldiers and other Mexican citizens. Vast swaths of Alta California's coastal regions and interior valleys became private *ranchos*, or cattle ranches. Three of the region's Spanish pueblos—Los Angeles, San Jose, and Sonoma—survived as Mexican towns. Other settlements developed around presidios at San Francisco, Monterey, Santa Barbara, and San Diego. Many rancho owners maintained residences in town, while hired vaqueros and unpaid Native American laborers worked on ranchos to produce cow hides and tallow (cow fat), commodities prized by foreign merchants (Starr 2005). After 1821, the Mexican government began welcoming non-Hispanic immigrants to Alta California. Hundreds of Americans, British, and other foreigners arrived to establish trading relationships; others became naturalized Mexican citizens and applied for land grants.

Following the Mexican-American War of 1846-1848, Mexico ceded Alta California to the United States. Under the Treaty of Guadalupe Hidalgo, Congress agreed to honor the property rights of former Mexican citizens living within the new boundaries of the United States. This required the United States to recognize Alta California's Mexican land grants. In 1851, Congress passed the California Land Act creating the Board of Land Commissioners to determine the validity of the individual grants, placing the burden of proof on patentees. The Board, with assistance from U.S. courts, confirmed most of California's Mexican land grants in subsequent decades (Starr 2005). In 1850, following a year of rapid growth associated with the Gold Rush, Congress admitted California as the 31st U.S. state (Starr 2005). In the following decades, federal surveyors arrived in California to stake out 36-square-mile townships and 1-square-mile sections on California's unclaimed (i.e., non-rancho) public lands. At general land offices, buyers paid cash for public lands. After 1862, many settlers filed homestead applications to obtain 40, 80, and 160-acre tracts at low upfront costs in exchange for establishing farms (Robinson 1948).

Woodcrest, Riverside County

Approximately 6 miles south of downtown Riverside, in a hilly, unclaimed section of Riverside County, settlers during the late 19th century established grain farms on a dry mesa in the east half of T3S, R4W and the west half of T3S, R3W. Their farms, by accounts, largely failed. Observers in 1907 criticized the area as "practically valueless…in the hills, remote from Riverside, [and] not even good grain land, as it is broken and barren and out of reach of any practicable means of irrigation" (*Los Angeles Times* 1907). The area's fortunes improved when modern gas- and electricity-powered drills and groundwater pumps produced newfound sources of irrigation water. During the 1920s, landowners subdivided multiple sections of the dry mesa into a patchwork of 5- and 10-acre farms. One of them, Woodcrest Acres, became advertised locally as a poultry farming community with "crystal clear water being secured at a depth of 40 feet" (*Daily News* 1927). A post office called *Woodcrest* appeared in 1926; it closed in 1936 but the community's name survived (Gunther 1984). In 1955, voters in Riverside, Corona, Lake Elsinore, and contiguous unincorporated areas approved the formation of the Western Municipal Water

District. It joined with other Southern California water districts to obtain Colorado River water. Subsequently the "hillslopes and mesa land of the Woodcrest and Lake Matthews areas were turned green by new citrus groves" (Patterson 1971:463). An observer in 1968 noted the "heavy planting of citrus" that occurred in Woodcrest during the 1960s; navel and Valencia oranges became the area's leading exports (*San Bernardino County Sun* 1968).

The Takeno Family

Rikinosuke and Kuniye (Yoda) Takeno immigrated to the United States from Japan in 1921 (Ancestry 2023a). The couple exchanged wedding vows in Los Angeles in January 1925 (Ancestry 2023b). By 1935, Rikinosuke and Kuniye owned and operated a farm at Rosemead in the San Gabriel Valley (Ancestry 2023a, 2023c). In August 1942, Rikinosuke, Kuniye, and their 4 children—Sumiko (12), Toshiko (9), Ben (7), and Roy (1)—left Rosemead and entered the Gila River War Relocation Center near Sacaton, Arizona under Executive Order 9066. A fifth child, Harry, was born in July 1945 at Gila River. The family left Arizona in October 1945 and settled in Anaheim (Ancestry 2023d, *Anaheim Gazette* 1956). In 1963, Rikinosuke and Kuniye acquired acreage in Woodcrest and built a Ranch-style residence and established a commercial orange grove. Their fourth child, Roy Takeno, managed the orange grove for several decades. The family sold the property in 1990 but continued leasing it through the early 21st century (*Press-Enterprise* 2013). For more than 40 years Roy Takeno served as a board member of the Riverside-Corona Resource Conservation District. Besides managing the family orange grove he also worked as a landscape contractor (Riverside-Corona Resource Conservation District 2013). Roy Takeno passed away in January 2022 (*Orange County Register* 2022).

Ranch-Style Residential Architecture

During the 1950s and 1960s, the Ranch style reigned as "by far the most popular house style built throughout the country" (McAlester 2013:602). Built on large lots, Ranch-style houses emphasized horizontality with single-story layouts, long, low, overhanging roofs, attached garages, rear patios, and bedrooms placed in ranges of wings to create exterior courtyards that evoked rambling rural haciendas of the historic California countryside. Its earliest practitioner, Cliff May, a Southern California architect, characterized the Ranch style as "everything a California house should be…it had cross-ventilation, the floor was level with the ground, and with its courtyard and the exterior corridor, it was about sunshine and informal outdoor living" (*New York Times* 1985). The form became a basic building block for low-density California suburbs in an age of an expanding middle class, higher rates of homeownership, and increased demand for larger houses as the baby boom generation came of age. "Throughout the United States, but especially in California, the architectural response to this demand for larger houses was the Ranch" (California Department of Transportation [Caltrans] 2011:71). The form was not rare; it proliferated throughout California.

III. RESEARCH

ECORP's research involved consulting published secondary sources and unpublished primary sources to develop historic contexts. Historic contexts discuss "those patterns or trends in history" that substantiate a building's eligibility or ineligibility for inclusion in the National Register of Historic Places (NRHP)/California Register of Historical Resources (CRHR) (National Park Service 1995). Buildings achieve significance and become eligible by meeting at least one of four NRHP/CRHR eligibility criteria (see Section VI). To evaluate AV-01 under Section 106 of the NHPA and CEQA, ECORP prepared a statewide historic context broadly discussing the development of California through the late 19th century; ECORP also prepared a local historic context discussing the development of Woodcrest through the 1960s. Lastly, ECORP prepared historic contexts that discuss the Takeno family, builders

of AV-01, and Ranch-style architecture, AV-01's architectural style. These historic contexts provided a frame of reference for evaluating AV-01's NRHP/CRHR eligibility.

IV. METHODS

To prepare historic contexts, ECORP consulted published secondary sources including Kevin Starr, *California: A History* (2005); Jane Davies Gunther, *Riverside County, California, Place Names* (1984); and Tom Patterson, *A Colony for California: Riverside's First Hundred Years* (1971). These published volumes discuss the major events and key individuals that shaped state and local patterns of development. For the historic context discussing Ranch-style architecture, ECORP consulted Virginia Savage McAlester, *A Field Guide to American Houses* (2013) and Caltrans, "Tract Housing in California, 1945-1973" (2011). Both sources provided information about the Ranch style's distinctive characteristics. For the historic context discussing the Takeno family, ECORP used obituaries, public records, and other primary sources available at Newspapers.com and Ancestry.com; ECORP used these sources to construct a narrative about the Takeno family's accomplishments. ECORP used historic newspapers, combined with 1962 and 1963 aerial photographs obtained from the University of California, Santa Barbara, to establish AV-01's year of construction and observe its original built form; research at the Riverside County Assessor's Office revealed that structural modifications to AV-01 occurred in 1984. Lastly, ECORP personnel visited AV-01 in June 2023 and completed a field inspection of the house to document its existing architectural characteristics.

V. RESULTS

Below is a description of AV-01 and the evaluation of significance follows. A Department of Parks and Recreation (DPR)-523 form is provided in Appendix D.

a) AV-01 (Residence at 15701 Chicago Avenue)

AV-01 is a wood-frame, one-story Ranch-style residence located at 15701 Chicago Avenue in Riverside County. Irregular in plan, the house has a medium-pitched, intersecting gable and hipped roof with broad overhanging eaves, exposed 2x6 rafters, and ceramic tile roofing. The house sits on a concrete crawlspace foundation. Its exterior consists of wood-stained clapboard and stucco siding. A single-leaf entry inset from the house's east (front) elevation provides interior access. An exterior chimney with wood-stained clapboard siding vents an interior fireplace. Sliding doors on the west elevation provide exterior access to a wooden porch enclosed by a wooden balustrade and shaded by a roof overhang supported by 4x4 wooden posts. Wooden stairs lead from the porch to a concrete patio; a flat roof supported by bracketed 4x4 wooden posts shades the patio. Fenestration consists of aluminum sliding windows and multiple vinyl replacements. Above the house's south elevation, a roof overhang supported by a 4x4 post clad in granite masonry covers a walkway between the main house and garage, connecting the two rooflines. The garage shares architectural characteristics with the main house; tilt-up doors provide vehicular access. A detached greenhouse with skylights located near the southwest corner of the house also shares architectural characteristics with the main house. Mature landscaping surrounding the house consisting of Japanese maples and a variety of shrubs and vines.

VI. SIGNIFICANCE

The eligibility criteria for the NRHP are as follows (36 Code of Federal Regulations [CFR] 60.4): "The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites,

buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or
(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history.

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Effects to NRHP-eligible resources (historic properties) are adverse if a project may alter, directly or indirectly, any of the characteristics of a Historic Property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

Separately, under State law (CEQA), cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the sites are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied.

A Historical Resource is a resource that:

1. is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission;
2. is included in a local register of historical resources, as defined in Public Resources Code (PRC) 5020.1(k);
3. has been identified as significant in a historical resources survey, as defined in PRC 5024.1(g); or
4. is determined to be historically significant by the CEQA lead agency California Code of Regulations (CCR) Title 14, Section 15064.5(a)]. In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

The eligibility criteria for the CRHR (CCR Title 14, Section 4852(b)) state that a resource is eligible if:

1. it is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.;
2. it is associated with the lives of persons important to local, California, or national history.
3. it embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. it has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the Nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association (CCR Title 14, Section 4852(c)). Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired (CCR Title 14, Section 15064.5(a)).

a) AV-01 (Residence at 15701 Chicago Avenue)

Criteria A/1

AV-01 met rural housing demands in Woodcrest during the 1960s as citrus farming took hold in the area. However, AV-01 did not, on its own, shape patterns of community development in Woodcrest. There is nothing in the archival record to suggest it is associated with events that have made a significant contribution to the broad patterns of Woodcrest's history. It is not eligible for the NRHP/CRHR under Criteria A/1.

Criteria B/2

Rikinosuke and Kuniye Takeno and their son, Roy Takeno, managed the citrus grove at 15701 Chicago Avenue and made AV-01 their primary place of residence between 1963 and 2022. The Takeno family produced navel and Valencia oranges. Neither Rikinosuke, Kuniye, nor Roy, however, significantly influenced the history of Woodcrest beyond the successful management of their commercial orange grove. There is nothing in the archival record to suggest that AV-01 is associated with persons significant in Woodcrest's past. It is not eligible for inclusion in the NRHP/CRHR under Criteria B/2.

Criteria C/3

Rikinosuke and Kuniye Takeno built AV-01 in 1963 and made structural alterations to the house in 1984; their architect remains unknown. AV-01 exhibits a typical Ranch-style form but lacks the ranges of wings and exterior courtyards that evoke rambling rural haciendas, a character-defining feature of the Ranch style. AV-01 does not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction. It is not eligible for inclusion in the NRHP/CRHR under Criteria C/3.

Criteria D/4

The information potential for AV-01 is expressed in its built form and in the historical record. It has not yielded, nor is it likely to yield, information important in history or prehistory. It is not eligible for inclusion in the NRHP/CRHR under Criteria D/4.

Integrity

AV-01 possesses integrity of location, setting, materials, workmanship, and feeling. It remains in its original location in a rural setting. It retains most of its original construction materials (despite the replacement of some windows) and conveys the overall aesthetic of a 1960s Ranch-style house. AV-01 possesses diminished integrity of design due to a significant 1984 remodel that altered the house's roofline and footprint. It also possesses diminished integrity of association due to the recent removal of its surrounding orange grove. Regardless of integrity, AV-01 is not eligible for inclusion in the NRHP or CRHR due to lack of historical significance. It does not contribute to a known or suspected historic district, and it is not listed on any Certified Local Government historic property register.

VII. IMPACT ASSESSMENT

Because AV-01, the residence at 15701 Chicago Avenue, does not qualify as a historic property under Section 106 of the NRHP, ECORP recommends a finding of No Historic Properties Affected.

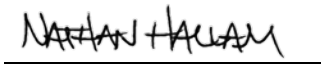
Because AV-01 does not qualify as a historical resource under CEQA, ECORP recommends a finding of No Impact.

VIII. RECOMMENDED MITIGATION

Due to the findings of No Historic Properties Affected and No Impact, ECORP recommends no avoidance, minimization, or mitigation strategies.

IX. CERTIFICATION

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this architectural history evaluation report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Prepared by:  Date July 5, 2023

Nathan Hallam, Ph.D.

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LIST OF APPENDICES

A. Location and Vicinity Map

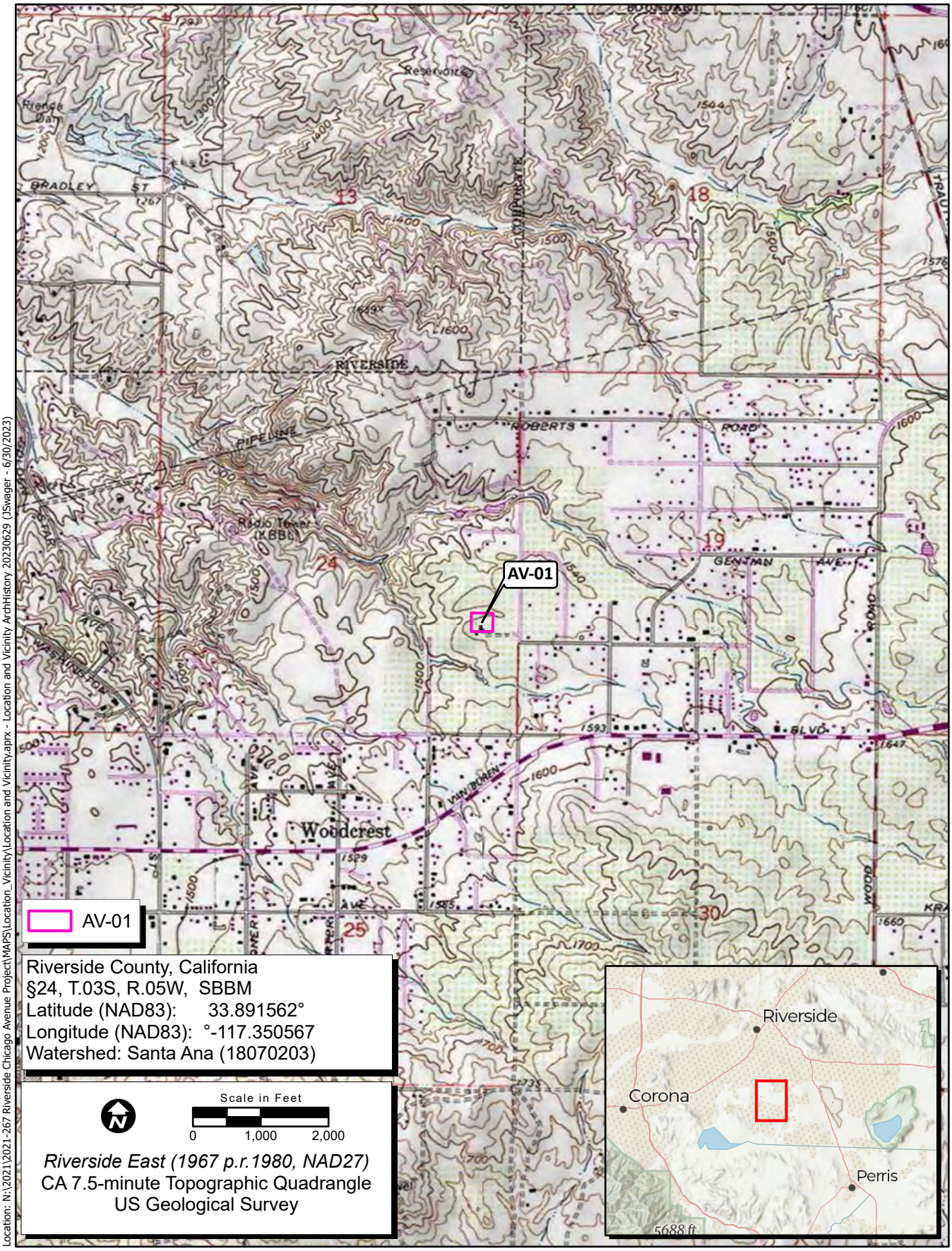
B. Photographs and Photo Record

C. Site Location Map

D. DPR Site Records

APPENDIX A

Location and Vicinity Map



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Map Date: 6/30/2023
Sources: ESRI, USGS

Appendix A. Location and Vicinity

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

APPENDIX B

Photographs and Photo Record

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IMG_5011

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APPENDIX C

Site Location Map

Map Features

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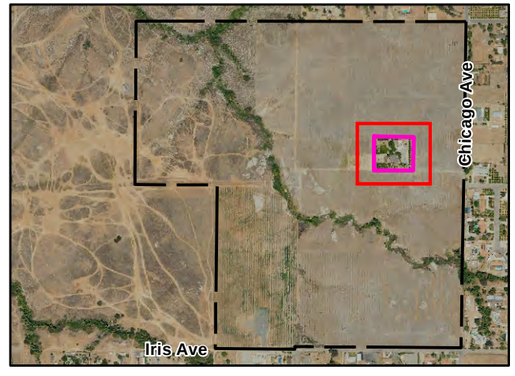
Sources: ESRI, Pictometry (2020), NAIP (2022), Rick Engineering



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APPENDIX D

DPR Site Record

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

Page □ of □ | □Resource Name or #: A□□□□

P1. Other Identifier:

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
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BUILDING, STRUCTURE, AND OBJECT RECORD

Page □ **of** □ ***NRHP Status Code** □□

***Resource Name or #** A□□□□

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***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** N/A **Original Location:** N/A

***B8. Related Features:** N/A

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***B10. Significance: Theme:** □ □□in□ **Area:** □ □□d□r□□□
Period of Significance: □□□□ **Property Type:** □in□□□□□□ i□□r□□id□n i□□ **Applicable Criteria:** N/A

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P3a. Description (continued):

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B10. Significance (continued):

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B12. References (continued):

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State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

LOCATION MAP

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***Resource Name or #:** AV-01

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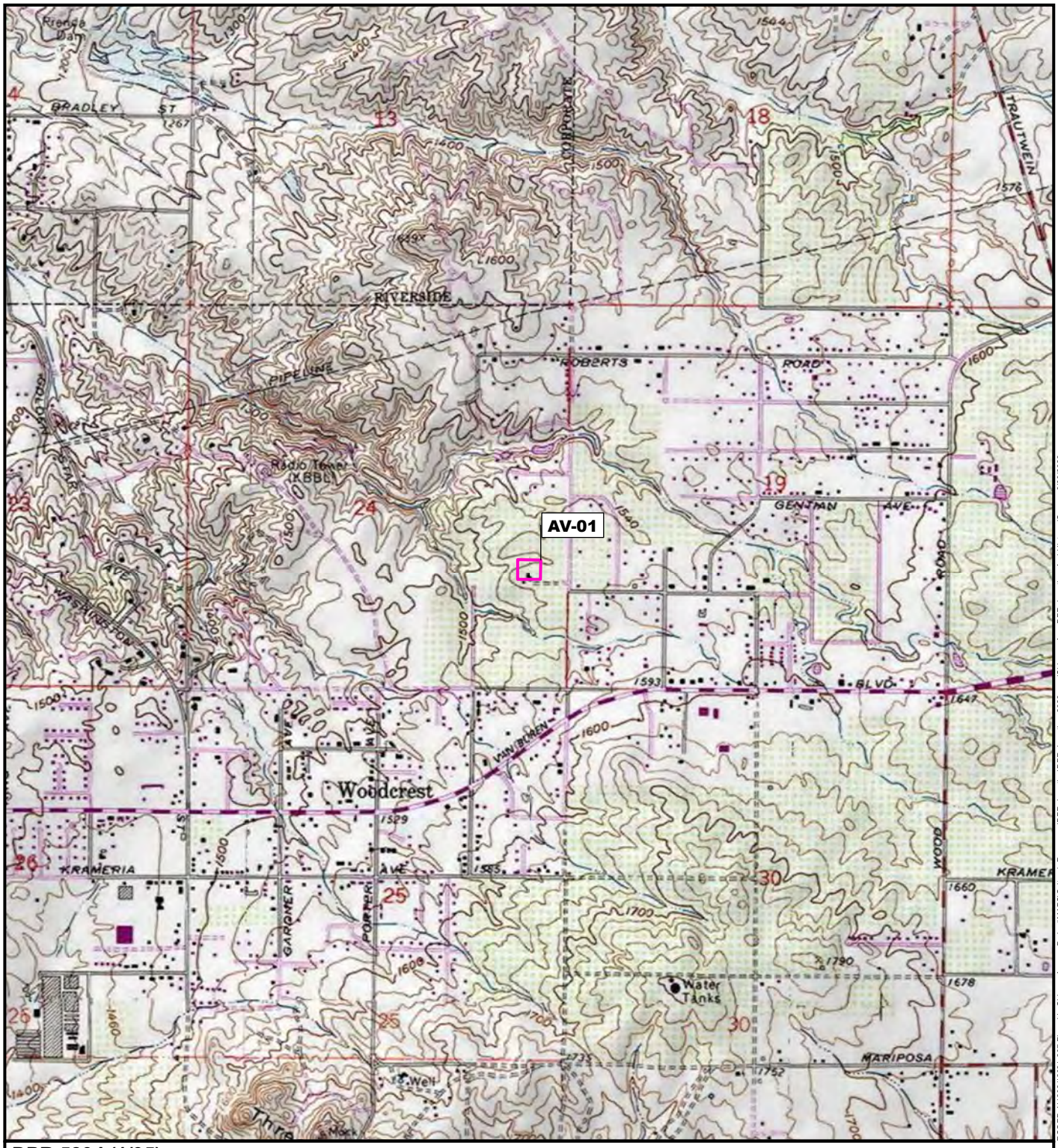

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Arroyo Vista

ENERGY ANALYSIS

COUNTY OF RIVERSIDE

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APRIL 27, 2023

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LIST OF ABBREVIATED TERMS

%	Percent
(1)	Reference
AQIA	*Arroyo Vista Air Quality Impact Analysis*
BACM	Best Available Control Measures
BTU	British Thermal Units
CalEEMod	California Emissions Estimator Model
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
County	County of Riverside
CPEP	Clean Power and Electrification Pathway
CPUC	California Public Utilities Commission
DMV	Department of Motor Vehicles
EIA	Energy Information Administration
EPA	Environmental Protection Agency
EMFAC	EMissions FACtor
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
GWh	Gigawatt Hour
HHDT	Heavy-Heavy Duty Trucks
hp-hr-gal	Horsepower Hours Per Gallon
IEPR	Integrated Energy Policy Report
ISO	Independent Service Operator
ISTEA	Intermodal Surface Transportation Efficiency Act
ITE	Institute of Transportation Engineers
kBTU	Thousand-British Thermal Units
kWh	Kilowatt Hour
LDA	Light Duty Auto
LDT1/LDT2	Light-Duty Trucks
LHDT1/LHDT2	Light-Heavy Duty Trucks
MARB/IPA	March Air Reserve Base/Inland Port Airport
MDV	Medium Duty Trucks
MHDT	Medium-Heavy Duty Trucks
MMcfd	Million Cubic Feet Per Day

mpg	Miles Per Gallon
MPO	Metropolitan Planning Organization
PG&E	Pacific Gas and Electric
Project	Arroyo Vista
PV	Photovoltaic
SCAB	South Coast Air Basin
SCE	Southern California Edison
SDAB	San Diego Air Basin
sf	Square Feet
SoCalGas	Southern California Gas
TEA-21	Transportation Equity Act for the 21st Century
U.S.	United States
VMT	Vehicle Miles Traveled

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EXECUTIVE SUMMARY

ES.1 SUMMARY OF FINDINGS

The results of this *Arroyo Vista Energy Analysis* is summarized below based on the significance criteria in Section 5 of this report consistent with Appendix G of the California Environmental Quality Act (CEQA) Statute and Guidelines (*CEQA Guidelines*) (1). Table ES-1 shows the findings of significance for potential energy impacts under CEQA.

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Energy Impact #1: Would the Project result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	5.0	*Less Than Significant*	*n/a*
Energy Impact #2: Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	5.0	*Less Than Significant*	*n/a*

ES.2 PROJECT REQUIREMENTS

The Project would be required to comply with regulations imposed by the federal and state agencies that regulate energy use and consumption through various means and programs. Those that are directly and indirectly applicable to the Project and that would assist in the reduction of energy usage include:

- Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)
- The Transportation Equity Act for the 21st Century (TEA-21)
- Integrated Energy Policy Report (IEPR)
- State of California Energy Plan
- California Code Title 24, Part 6, Energy Efficiency Standards
- California Code Title 24, Part 11, California Green Building Standards Code (CALGreen)
- AB 1493 Pavley Regulations and Fuel Efficiency Standards
- California's Renewable Portfolio Standard (RPS)
- Clean Energy and Pollution Reduction Act of 2015 (SB 350)

Consistency with the above regulations is discussed in detail in section 5 of this report.

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1 INTRODUCTION

This report presents the results of the energy analysis prepared by Urban Crossroads, Inc., for the proposed Arroyo Vista Project (Project). The purpose of this report is to ensure that energy implication is considered by the County of Riverside (Lead Agency), as the lead agency, and to quantify anticipated energy usage associated with construction and operation of the proposed Project, determine if the usage amounts are efficient, typical, or wasteful for the land use type, and to emphasize avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

1.1 SITE LOCATION

The Project site is located on the northwest corner of Chicago Avenue and Iris Avenue in the Woodcrest area of unincorporated County of Riverside, as shown on Exhibit 1-A.

1.2 PROJECT DESCRIPTION

The Project consists of the development of 233[1] single family detached residential dwelling units and associated improvements. The Project is anticipated to be developed in two phases with an opening year of 2026 and 2027, as shown on Exhibit 1-B. The proposed Project is anticipated to be developed in the following phases:

- Phase 1 (2026): 121 single family residential dwelling units
- Project Buildout (2027): 112 single family residential dwelling units

[1] The trip generation utilized in this analysis is based on a previous site plan which assumed slightly more units. As such, the emissions analyzed in this report may be slightly overstated and present a worst case scenario.

EXHIBIT 1-A: LOCATION MAP

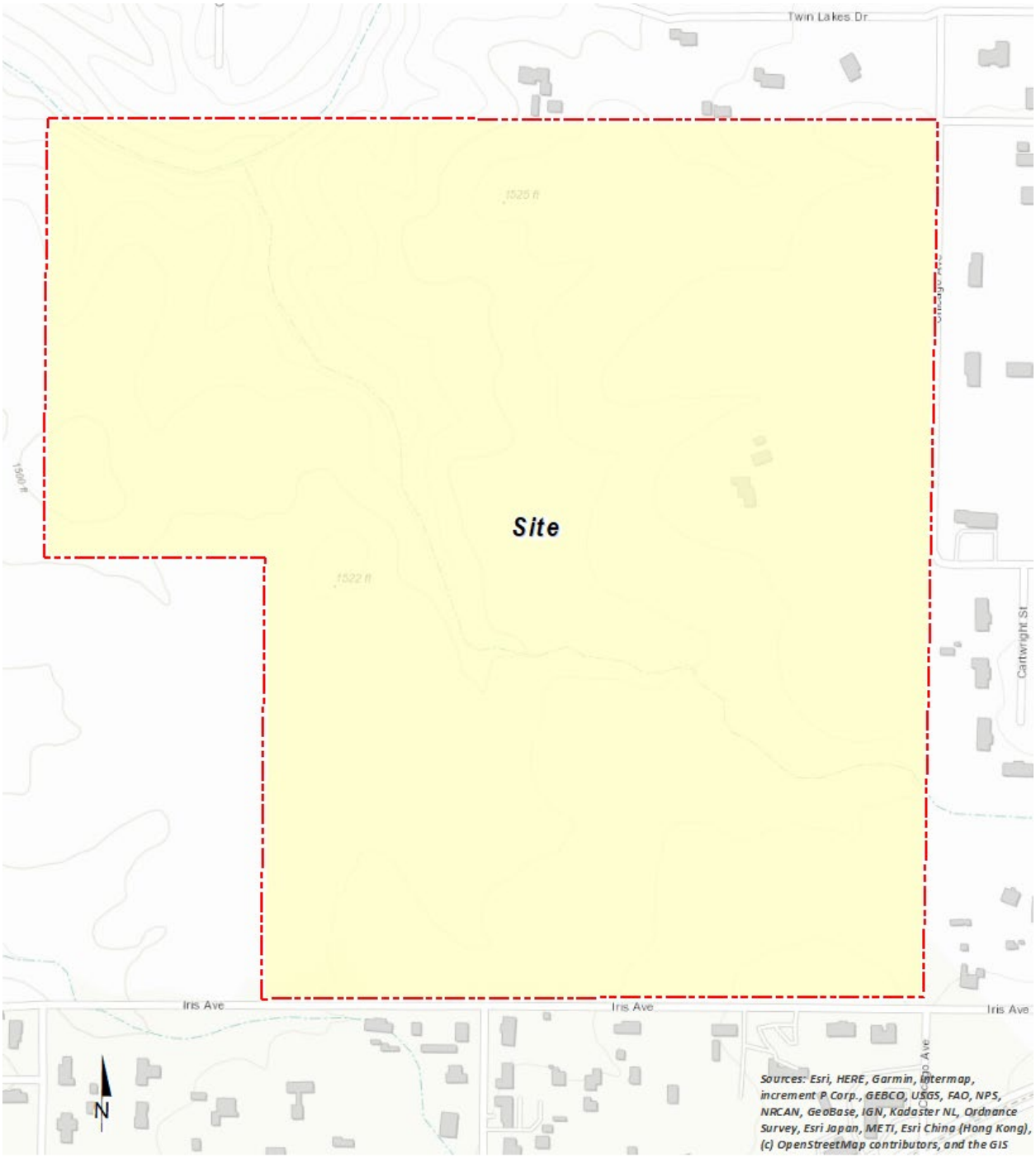
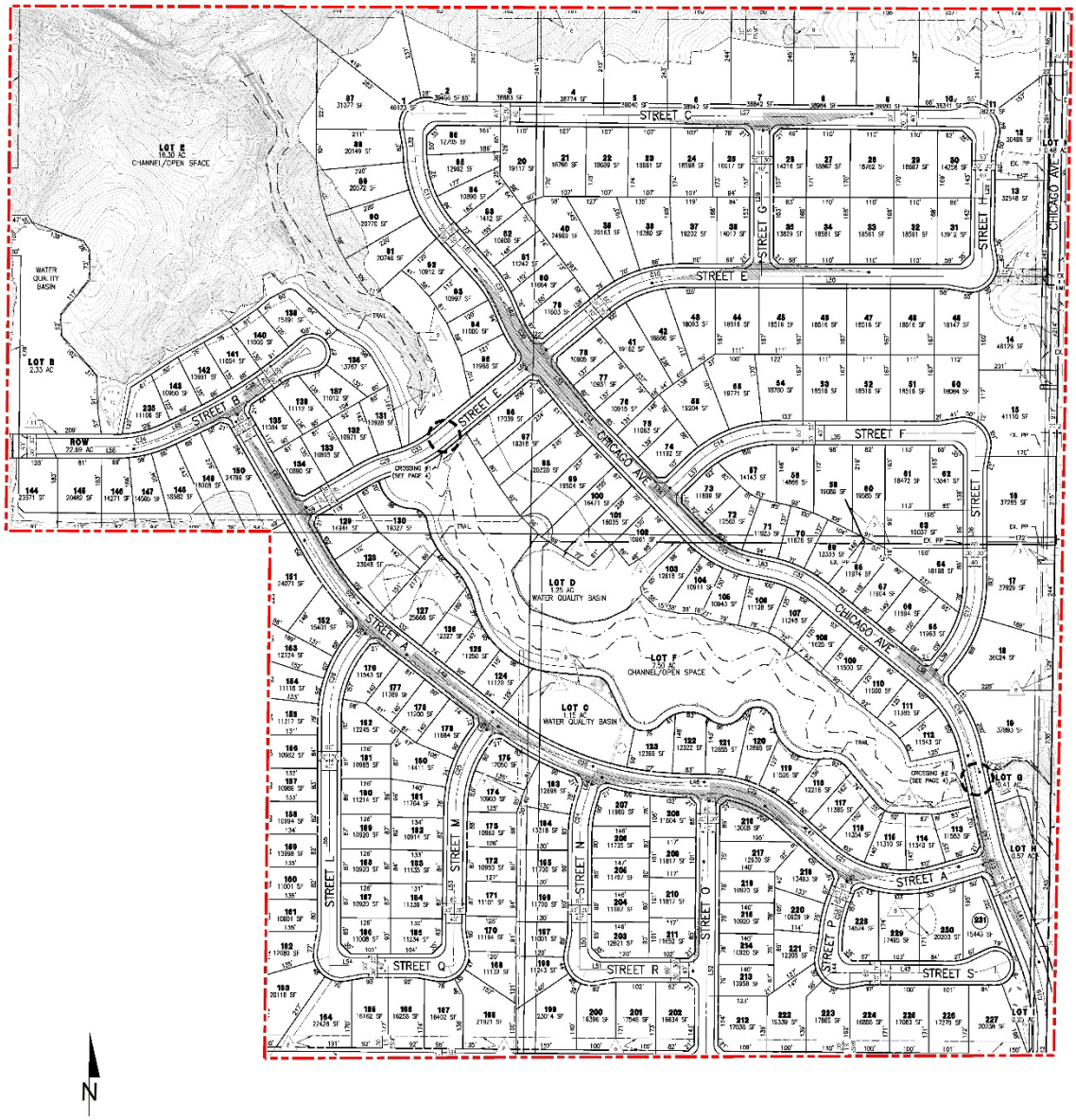


EXHIBIT 1-B: SITE PLAN



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2 EXISTING CONDITIONS

This section provides an overview of the existing energy conditions in the Project region.

2.1 OVERVIEW

The most recent data for California's estimated total energy consumption and natural gas consumption is from 2020, released by the United States (U.S.) Energy Information Administration's (EIA) California State Profile and Energy Estimates in 2021 and included (2):

- As of 2020, approximately 6,923 trillion British Thermal Unit (BTU) of energy was consumed
- As of 2020, approximately 524 million barrels of petroleum
- As of 2020, approximately 2,075 billion cubic feet of natural gas
- As of 2020, approximately 1 million short tons of coal

According to the EIA, in 2021 the U.S. petroleum consumption comprised about 77% of all transportation energy use, excluding fuel consumed for aviation and most marine vessels (3). In 2021, about 249,790 million gallons (or about 5.95 million barrels) of finished petroleum products were consumed in the U.S., an average of about 684 million gallons per day (or about 16 million barrels per day) (4). In 2021, California consumed approximately 12,157 million gallons in motor gasoline (33.31 million per day) and approximately 3,541 million gallons of diesel fuel (9.7 million per day) (5).

The most recent data provided by the EIA for energy use in California by demand sector is from 2020 and is reported as follows:

- Approximately 34.0% transportation
- Approximately 24.6% industrial
- Approximately 21.8% residential
- Approximately 19.6% commercial (6)

According to the EIA, California used approximately 247,250 gigawatt hours of electricity in 2021 (7). By sector in 2021, residential uses utilized 36.5% of the state's electricity, followed by 43.9% for commercial uses, 19.2% for industrial uses, and 0.3% for transportation. Electricity usage in California for differing land uses varies substantially by the type of uses in a building, type of construction materials used in a building, and the efficiency of all electricity-consuming devices within a building (7).

According to the EIA, California used approximately 200,871 million therms of natural gas in 2021 (8). In 2021 (the most recent year for which data is available), by sector, industrial uses utilized 33% of the state's natural gas, followed by 30% used as fuel in the electric power sector, 21% from residential, 11% from commercial, 1% from transportation uses and the remaining 3% was utilized for the operations, processing and production of natural gas itself (8). While the supply of natural gas in the United States and production in the lower 48 states has increased greatly since 2008, California produces little, and imports 90% of its supply of natural gas (8).

In 2021, total system electric generation for California was 277,764 gigawatt hours (GWh). California's massive electricity in-state generation system generated approximately 194,127 GWh which accounted for approximately 70% of the electricity it uses; the rest was imported from the Pacific Northwest (12%) and the U.S. Southwest (18%) (9). Natural gas is the main source for electricity generation at 50.2% of the total in-state electric generation system power as shown in Table 2-1.

An updated summary of, and context for energy consumption and energy demands within the State is presented in "U.S. Energy Information Administration, California State Profile and Energy Estimates, Quick Facts" excerpted below (7):

- In 2021, California was the seventh-largest producer of crude oil among the 50 states, and, as of January 2021, it ranked third in crude oil refining capacity.
- California is the largest consumer of jet fuel and second-largest consumer of motor gasoline among the 50 states and, the state accounted for 15% of the nation's jet fuel consumption and 10% of motor gasoline consumption in 2020.
- In 2019, California was the second-largest total energy consumer among the states, but its per capita energy consumption was less than in all other states except Rhode Island, due in part to its mild climate and its energy efficiency programs.
- In 2021, California was the nation's top producer of electricity from solar, geothermal, and biomass energy. The state was fourth in the nation in conventional hydroelectric power generation, down from second in 2019, in part because of drought and increased water demand.
- In 2021, California was the fourth-largest electricity producer in the nation, but the state was also the nation's second-largest consumer of electricity, and in 2020, it received about 30% of its electricity supply from generating facilities outside of California, including imports from Mexico.

As indicated below, California is one of the nation's leading energy-producing states, and California's per capita energy use is among the nation's most efficient. Given the nature of the Project, the remainder of this discussion will focus on the three sources of energy that are most relevant to the Project—namely, electricity, natural gas, and transportation fuel for vehicle trips associated with the uses planned for the Project.

TABLE 2-1: TOTAL ELECTRICITY SYSTEM POWER (CALIFORNIA 2021)

Fuel Type	California In-State Generation (GWh)	% of California In-State Generation	Northwest Imports (GWh)	Southwest Imports (GWh)	Total Imports (GWh)	% of Imports	Total California Energy Mix	Total California Power Mix
Coal	303	0.2%	181	7,788	7,969	9.5%	8,272	3.0%
Natural Gas	97,431	50.2%	45	7,880	7,925	9.5%	105,356	379.0%
Oil	37	0.0%	-	-	-	0.0%	37	0.0%
Other (Waste Heat/Petroleum Coke)	382	0.2%	68	15	83	0.1%	465	0.2%
Nuclear	16,477	8.5%	524	8,756	9,281	11.1%	25,758	9.3%
Large Hydro	12,036	6.2%	12,042	1,578	13,620	16.3%	25,656	9.2%
Unspecified	-	0.0%	8,156	10,731	18,887	22.6%	18,887	6.8%
Total Thermal and Non-Renewables	**126,666**	**65.2%**	**21,017**	**36,748**	**57,764**	**6910.0%**	**184,431**	**66.4%**
Biomass	5,381	2.8%	864	26	890	1.1%	6,271	2.3%
Geothermal	11,116	5.7%	192	1,906	2,098	2.5%	13,214	4.8%
Small Hydro	2,531	1.3%	304	1	304	0.4%	2,835	1.0%
Solar	33,260	17.1%	220	5,979	6,199	7.4%	39,458	14.2%
Wind	15,173	7.8%	9,976	6,405	16,381	19.6%	31,555	11.4%
Total Renewables	**67,461**	**34.8%**	**11,555**	**14,317**	**25,872**	**3090.0%**	**93,333**	**33.6%**
SYSTEM TOTALS	***194,127***	***100.0%***	***32,572***	***51,064***	***83,636***	***100.0%***	***277,764***	***100.0%***

Source: CECs 2021 Total System Electric Generation

2.2 ELECTRICITY

The usage associated with electricity use were calculated using the California Emissions Estimator Model (CalEEMod) Version 2022.1. The Southern California region's electricity reliability has been of concern for the past several years due to the planned retirement of aging facilities that depend upon once-through cooling technologies, as well as the June 2013 retirement of the San Onofre Nuclear Generating Station (San Onofre). While the once-through cooling phase-out has been ongoing since the May 2010 adoption of the State Water Resources Control Board's once-through cooling policy, the retirement of San Onofre complicated the situation. California ISO studies revealed the extent to which the South California Air Basin (SCAB) and the San Diego Air Basin (SDAB) region were vulnerable to low-voltage and post-transient voltage instability concerns. A preliminary plan to address these issues was detailed in the 2013 Integrative Energy Policy Report (IEPR) after a collaborative process with other energy agencies, utilities, and air districts (15). Similarly, the subsequent 2022 IEPR provides information and policy recommendations on advancing a clean, reliable, and affordable energy system.

Electricity is currently provided to the Project by Southern California Edison (SCE). SCE provides electric power to more than 15 million persons in 15 counties and in 180 incorporated cities, within a service area encompassing approximately 50,000 square miles. Based on SCE's 2020 Power Content Label Mix, SCE derives electricity from varied energy resources including: fossil fuels, hydroelectric generators, nuclear power plants, geothermal power plants, solar power generation, and wind farms. SCE also purchases from independent power producers and utilities, including out-of-state suppliers (16).

California's electricity industry is an organization of traditional utilities, private generating companies, and state agencies, each with a variety of roles and responsibilities to ensure that electrical power is provided to consumers. The California Independent Service Operator (ISO) is a nonprofit public benefit corporation and is the impartial operator of the State's wholesale power grid and is charged with maintaining grid reliability, and to direct uninterrupted electrical energy supplies to California's homes and communities. While utilities still own transmission assets, the ISO routes electrical power along these assets, maximizing the use of the transmission system and its power generation resources. The ISO matches buyers and sellers of electricity to ensure that enough power is available to meet demand. To these ends, every five minutes the ISO forecasts electrical demands, accounts for operating reserves, and assigns the lowest cost power plant unit to meet demands while ensuring adequate system transmission capacities and capabilities (17).

Part of the ISO's charge is to plan and coordinate grid enhancements to ensure that electrical power is provided to California consumers. To this end, utilities file annual transmission expansion/modification plans to accommodate the State's growing electrical needs. The ISO reviews and either approves or denies the proposed additions. In addition, and perhaps most importantly, the ISO works with other areas in the western United States electrical grid to ensure that adequate power supplies are available to the State. In this manner, continuing reliable and affordable electrical power is assured to existing and new consumers throughout the State.

Tables 2-2 identifies SCE's specific proportional shares of electricity sources in 2021. As indicated in Table 2-2, the 2021 SCE Power Mix has renewable energy at 31.4% of the overall energy resources. Geothermal resources are at 5.7%, wind power is at 10.2%, large hydroelectric sources are at 2.3%, solar energy is at 14.9%, and coal is at 0% (18).

TABLE 2-2: SCE 2021 POWER CONTENT MIX

Energy Resources	2021 SCE Power Mix
Eligible Renewable	**31.4%**
Biomass & Waste	0.1%
Geothermal	5.7%
Eligible Hydroelectric	0.5%
Solar	14.9%
Wind	10.2%
Coal	**0.0%**
Large Hydroelectric	**2.3%**
Natural Gas	**22.3%**
Nuclear	**9.2%**
Other	**0.2%**
Unspecified Sources of power*	34.6%
Total	**100%**

* "Unspecified sources of power" means electricity from transactions that are not traceable to specific generation sources

2.3 NATURAL GAS

The following summary of natural gas customers and volumes, supplies, delivery of supplies, storage, service options, and operations is excerpted from information provided by the California Public Utilities Commission (CPUC).

> *"The CPUC regulates natural gas utility service for approximately 10.8 million customers that receive natural gas from Pacific Gas and Electric (PG&E), Southern California Gas (SoCalGas), San Diego Gas & Electric (SDG&E), Southwest Gas, and several smaller natural gas utilities. The CPUC also regulates independent storage operators: Lodi Gas Storage, Wild Goose Storage, Central Valley Storage and Gill Ranch Storage.*
>
> *California's natural gas utilities provide service to over 11 million gas meters. SoCalGas and PG&E provide service to about 5.9 million and 4.3 million customers, respectively, while SDG&E provides service to over 800, 000 customers. In 2018, California gas utilities forecasted that they would deliver about 4740 million cubic feet per day (MMcfd) of gas to their customers, on average, under normal weather conditions.*
>
> *The overwhelming majority of natural gas utility customers in California are residential and small commercials customers, referred to as "core" customers. Larger volume gas*

customers, like electric generators and industrial customers, are called "noncore" customers. Although very small in number relative to core customers, noncore customers consume about 65% of the natural gas delivered by the state's natural gas utilities, while core customers consume about 35%.

A significant amount of gas (about 19%, or 1131 MMcfd, of the total forecasted California consumption in 2018) is also directly delivered to some California large volume consumers, without being transported over the regulated utility pipeline system. Those customers, referred to as "bypass" customers, take service directly from interstate pipelines or directly from California producers.

SDG&E and Southwest Gas' southern division are wholesale customers of SoCalGas, i.e., they receive deliveries of gas from SoCalGas and in turn deliver that gas to their own customers. (Southwest Gas also provides natural gas distribution service in the Lake Tahoe area). Similarly, West Coast Gas, a small gas utility, is a wholesale customer of PG&E. Some other wholesale customers are municipalities like the cities of Palo Alto, Long Beach, and Vernon, which are not regulated by the CPUC.

Natural gas from out-of-state production basins is delivered into California via the interstate natural gas pipeline system. The major interstate pipelines that deliver out-of-state natural gas to California gas utilities are Gas Transmission Northwest Pipeline, Kern River Pipeline, Transwestern Pipeline, El Paso Pipeline, Ruby Pipeline, Mojave Pipeline, and Tuscarora. Another pipeline, the North Baja - Baja Norte Pipeline takes gas off the El Paso Pipeline at the California/Arizona border and delivers that gas through California into Mexico. While the Federal Energy Regulatory Commission (FERC) regulates the transportation of natural gas on the interstate pipelines, and authorizes rates for that service, the California Public Utilities Commission may participate in FERC regulatory proceedings to represent the interests of California natural gas consumers.

The gas transported to California gas utilities via the interstate pipelines, as well as some of the California-produced gas, is delivered into the PG&E and SoCalGas intrastate natural gas transmission pipelines systems (commonly referred to as California's "backbone" pipeline system). Natural gas on the utilities' backbone pipeline systems is then delivered to the local transmission and distribution pipeline systems, or to natural gas storage fields. Some large volume noncore customers take natural gas delivery directly off the high-pressure backbone and local transmission pipeline systems, while core customers and other noncore customers take delivery off the utilities' distribution pipeline systems. The state's natural gas utilities operate over 100,000 miles of transmission and distribution pipelines, and thousands more miles of service lines.

Bypass customers take most of their deliveries directly off the Kern/Mojave pipeline system, but they also take a significant amount of gas from California production.

PG&E and SoCalGas own and operate several natural gas storage fields that are located within their service territories in northern and southern California, respectively. These storage fields, and four independently owned storage utilities - Lodi Gas Storage, Wild

Goose Storage, Central Valley Storage, and Gill Ranch Storage - help meet peak seasonal and daily natural gas demand and allow California natural gas customers to secure natural gas supplies more efficiently. PG&E is a 25% owner of the Gill Ranch Storage field. These storage fields provide a significant amount of infrastructure capacity to help meet California's natural gas requirements, and without these storage fields, California would need much more pipeline capacity in order to meet peak gas requirements.

Prior to the late 1980s, California regulated utilities provided virtually all natural gas services to all their customers. Since then, the Commission has gradually restructured the California gas industry in order to give customers more options while assuring regulatory protections for those customers that wish to, or are required to, continue receiving utility-provided services.

The option to purchase natural gas from independent suppliers is one of the results of this restructuring process. Although the regulated utilities procure natural gas supplies for most core customers, core customers have the option to purchase natural gas from independent natural gas marketers, called "core transport agents" (CTA). Contact information for core transport agents can be found on the utilities' web sites. Noncore customers, on the other hand, make natural gas supply arrangements directly with producers or with marketers.

Another option resulting from the restructuring process occurred in 1993, when the Commission removed the utilities' storage service responsibility for noncore customers, along with the cost of this service from noncore customers' transportation rates. The Commission also encouraged the development of independent storage fields, and in subsequent years, all the independent storage fields in California were established. Noncore customers and marketers may now take storage service from the utility or from an independent storage provider (if available), and pay for that service, or may opt to take no storage service at all. For core customers, the Commission assures that the utility has adequate storage capacity set aside to meet core requirements, and core customers pay for that service.

In a 1997 decision, the Commission adopted PG&E's "Gas Accord", which unbundled PG&E's backbone transmission costs from noncore transportation rates. This decision gave customers and marketers the opportunity to obtain pipeline capacity rights on PG&E's backbone transmission pipeline system, if desired, and pay for that service at rates authorized by the Commission. The Gas Accord also required PG&E to set aside a certain amount of backbone transmission capacity in order to deliver gas to its core customers. Subsequent Commission decisions modified and extended the initial terms of the Gas Accord. The "Gas Accord" framework is still in place today for PG&E's backbone and storage rates and services and is now simply referred to as PG&E Gas Transmission and Storage (GT&S).

In a 2006 decision, the Commission adopted a similar gas transmission framework for Southern California, called the "firm access rights" system. SoCalGas and SDG&E implemented the firm access rights (FAR) system in 2008, and it is now referred to as the

backbone transmission system (BTS) framework. As under the PG&E backbone transmission system, SoCalGas backbone transmission costs are unbundled from noncore transportation rates. Noncore customers and marketers may obtain, and pay for, firm backbone transmission capacity at various receipt points on the SoCalGas system. A certain amount of backbone transmission capacity is obtained for core customers to assure meeting their requirements.

Many if not most noncore customers now use a marketer to provide for several of the services formerly provided by the utility. That is, a noncore customer may simply arrange for a marketer to procure its supplies, and obtain any needed storage and backbone transmission capacity, in order to assure that it will receive its needed deliveries of natural gas supplies. Core customers still mainly rely on the utilities for procurement service, but they have the option to take procurement service from a CTA. Backbone transmission and storage capacity is either set aside or obtained for core customers in amounts to assure very high levels of service.

In order properly operate their natural gas transmission pipeline and storage systems, PG&E and SoCalGas must balance the amount of gas received into the pipeline system and delivered to customers or to storage fields. Some of these utilities' storage capacity is dedicated to this service, and under most circumstances, customers do not need to precisely match their deliveries with their consumption. However, when too much or too little gas is expected to be delivered into the utilities' systems, relative to the amount being consumed, the utilities require customers to more precisely match up their deliveries with their consumption. And, if customers do not meet certain delivery requirements, they could face financial penalties. The utilities do not profit from these financial penalties - the amounts are then returned to customers as a whole. If the utilities find that they are unable to deliver all the gas that is expected to be consumed, they may even call for a curtailment of some gas deliveries. These curtailments are typically required for just the largest, noncore customers. It has been many years since there has been a significant curtailment of core customers in California." (19)

As indicated in the preceding discussions, natural gas is available from a variety of in-state and out-of-state sources and is provided throughout the state in response to market supply and demand. Complementing available natural gas resources, biogas may soon be available via existing delivery systems, thereby increasing the availability and reliability of resources in total. The CPUC oversees utility purchases and transmission of natural gas to ensure reliable and affordable natural gas deliveries to existing and new consumers throughout the State.

2.4 TRANSPORTATION ENERGY RESOURCES

The Project would generate additional vehicle trips with resulting consumption of energy resources, predominantly gasoline and diesel fuel. The Department of Motor Vehicles (DMV) identified 36.2 million registered vehicles in California (20), and those vehicles consume an estimated 17.2 billion gallons of fuel each year[2]. Gasoline (and other vehicle fuels) are

[2] Fuel consumptions estimated utilizing information from EMFAC2021.

commercially provided commodities and would be available to the Project patrons and employees via commercial outlets.

California's on-road transportation system includes 396,616 lane miles, more than 26.6 million passenger vehicles and light trucks, and almost 9.0 million medium- and heavy-duty vehicles (20). While gasoline consumption has been declining since 2008 it is still by far the dominant fuel. California is the second-largest consumer of petroleum products, after Texas, and accounts for 10% of the nation's total consumption. The state is the largest U.S. consumer of motor gasoline and jet fuel, and 85% of the petroleum consumed in California is used in the transportation sector (21).

California accounts for less than 1% of total U.S. natural gas reserves and production. As with crude oil, California's natural gas production has experienced a gradual decline since 1985. In 2019, about 37% of the natural gas delivered to consumers went to the state's industrial sector, and about 28% was delivered to the electric power sector. Natural gas fueled more than two-fifths of the state's utility-scale electricity generation in 2019. The residential sector, where two-thirds of California households use natural gas for home heating, accounted for 22% of natural gas deliveries. The commercial sector received 12% of the deliveries to end users and the transportation sector consumed the remaining 1% (21).

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3 REGULATORY BACKGROUND

Federal and state agencies regulate energy use and consumption through various means and programs. On the federal level, the United States Department of Transportation, the United States Department of Energy, and the United States Environmental Protection Agency (EPA) are three federal agencies with substantial influence over energy policies and programs. On the state level, the CPUC and the CEC are two agencies with authority over different aspects of energy. Relevant federal and state energy-related laws and plans are summarized below.

3.1 FEDERAL REGULATIONS

3.1.1 INTERMODAL SURFACE TRANSPORTATION EFFICIENCY ACT OF 1991 (ISTEA)

The ISTEA promoted the development of inter-modal transportation systems to maximize mobility as well as address national and local interests in air quality and energy. ISTEA contained factors that Metropolitan Planning Organizations (MPOs) were to address in developing transportation plans and programs, including some energy-related factors. To meet the new ISTEA requirements, MPOs adopted explicit policies defining the social, economic, energy, and environmental values guiding transportation decisions.

3.1.2 THE TRANSPORTATION EQUITY ACT FOR THE 21ST CENTURY (TEA-21)

The TEA-21 was signed into law in 1998 and builds upon the initiatives established in the ISTEA legislation, discussed above. TEA-21 authorizes highway, highway safety, transit, and other efficient surface transportation programs. TEA-21 continues the program structure established for highways and transit under ISTEA, such as flexibility in the use of funds, emphasis on measures to improve the environment, and focus on a strong planning process as the foundation of good transportation decisions. TEA-21 also provides for investment in research and its application to maximize the performance of the transportation system through, for example, deployment of Intelligent Transportation Systems, to help improve operations and management of transportation systems and vehicle safety.

3.2 CALIFORNIA REGULATIONS

3.2.1 INTEGRATED ENERGY POLICY REPORT (IEPR)

Senate Bill 1389 (Bowen, Chapter 568, Statutes of 2002) requires the CEC to prepare a biennial integrated energy policy report that assesses major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code § 25301[a]). The CEC prepares these assessments and associated policy recommendations every two years, with updates in alternate years, as part of the Integrated Energy Policy Report.

The 2022 IEPR was adopted February 2023, and continues to work towards improving electricity, natural gas, and transportation fuel energy use in California. The 2022 IEPR introduces a new

framework for embedding equity and environmental justice at the CEC and the California Energy Planning Library which allows for easier access to energy data and analytics for a wide range of users. Additionally, energy reliability, western electricity integration, gasoline cost factors and price spikes, the role of hydrogen in California's clean energy future, fossil gas transition and distributed energy resources are topics discussed within the 2022 IEPR (22).

3.2.2 STATE OF CALIFORNIA ENERGY PLAN

The CEC is responsible for preparing the State Energy Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. The Plan calls for the state to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. To further this policy, the plan identifies several strategies, including assistance to public agencies and fleet operators and encouragement of urban designs that reduce vehicle miles traveled (VMT) and accommodate pedestrian and bicycle access.

3.2.3 CALIFORNIA CODE TITLE 24, PART 6, ENERGY EFFICIENCY STANDARDS

California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption.

The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases greenhouse gas (GHG) emissions. The 2022 version of Title 24 was adopted by the CEC and will be effective on January 1, 2023. The 2022 Title 24 standards require solar photovoltaic systems for new homes, establish requirements for newly constructed healthcare facilities, encourage demand responsive technologies for residential buildings, and update indoor and outdoor lighting standards for nonresidential buildings.

The CEC anticipates that the 2022 energy code will provide $1.5 billion in consumer benefits and reduce GHG emissions by 10 million metric tons (24). The Project would be required to comply with the applicable standards in place at the time building permit document submittals are made. These require, among other items (25):

RESIDENTIAL MANDATORY MEASURES

- EV Charging (new one- and two-family dwellings and townhouses with attached private garages). For each dwelling unit, install a listed raceway to accommodate a dedicated 208/240-volt branch circuit. The raceway shall not be less than trade size 1 (nominal 1-inch inside diameter). The raceway shall originate at the main service or subpanel and shall terminate into a listed cabinet, box or other enclosure in close proximity to the proposed location of an EV charger. Raceways are required to be continuous at enclosed, inaccessible or concealed areas and spaces. The service panel and/or subpanel shall provide capacity to install a 40-ampere minimum dedicated branch circuit and space(s) reserved to permit installation of a branch circuit overcurrent protective device (4.106.4.1).

- Short-term bicycle parking. If the new project or an additional alteration is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5% of new visitor motorized vehicle parking spaces being added, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with tenant spaces that have ten or more tenant-occupants, provide secure bicycle parking for 5% of the tenant-occupant vehicular parking spaces with a minimum of one bicycle parking facility (5.106.4.1.2).
- Designated parking. In new projects or additions to alterations that add ten or more vehicular parking spaces, provide designated parking for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Construction waste management. Recycle and/or salvage for reuse a minimum of 65% of the nonhazardous construction and demolition waste in accordance with Section 5.408.1.1. 5.405.1.2, or 5.408.1.3; or meet a local construction and demolition waste management ordinance, whichever is more stringent (5.408.1).
- Excavated soil and land clearing debris. 100% of trees, stumps, rocks and associated vegetation and soils resulting primarily from land clearing shall be reused or recycled. For a phased project, such material may be stockpiled on site until the storage site is developed (5.408.3).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of non-hazardous materials for recycling, including (at a minimum) paper, corrugated cardboard, glass, plastics, organic waste, and metals or meet a lawfully enacted local recycling ordinance, if more restrictive (5.410.1).
- Water conserving plumbing fixtures and fittings. Plumbing fixtures (water closets and urinals) and fittings (faucets and showerheads) shall comply with the following:
    - Water Closets. The effective flush volume of all water closets shall not exceed 1.28 gallons per flush (5.303.3.1).
    - Urinals. The effective flush volume of wall-mounted urinals shall not exceed 0.125 gallons per flush (5.303.3.2.1). The effective flush volume of floor-mounted or other urinals shall not exceed 0.5 gallons per flush (5.303.3.2.2).
    - Showerheads. Single showerheads shall have a minimum flow rate of not more than 1.8 gallons per minute and 80 psi (5.303.3.3.1). When a shower is served by more than one showerhead, the combine flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gallons per minute at 80 psi (5.303.3.3.2).
    - Faucets and fountains. Nonresidential lavatory faucets shall have a maximum flow rate of note more than 0.5 gallons per minute at 60 psi (5.303.3.4.1). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute of 60 psi (5.303.3.4.2). Wash fountains shall have a maximum flow rate of not more than 1.8 gallons per minute (5.303.3.4.3). Metering faucets shall not deliver more than 0.20 gallons per cycle (5.303.3.4.4). Metering faucets for wash fountains shall have a maximum flow rate not more than 0.20 gallons per cycle (5.303.3.4.5).
        - Residential lavatory faucets shall have a maximum flow rate of note more than 1.2 gallons per minute at 60 psi (4.303.1.4.1). Lavatory faucets in common or public use areas shall have a maximum flow rate of note more than 0.5 gallons per minute at 60 psi (4.303.1.4.2). Metering faucets shall not deliver more than 0.25 gallons per cycle

(4.303.1.4.3). Kitchen faucets shall have a maximum flow rate of not more than 1.8 gallons per minute of 60 psi (4.303.1.4.4).

- Outdoor potable water use in landscaped areas. Nonresidential developments shall comply with a local water efficient landscape ordinance or the current California Department of Water Resources' Model Water Efficient Landscape Ordinance (MWELO), whichever is more stringent (5.304.1).
- Water meters. Separate submeters or metering devices shall be installed for new buildings or additions in excess of 50,000 sf or for excess consumption where any tenant within a new building or within an addition that is projected to consume more than 1,000 gal/day (5.303.1.1 and 5.303.1.2).
- Outdoor water use in rehabilitated landscape projects equal or greater than 2,500 sf. Rehabilitated landscape projects with an aggregate landscape area equal to or greater than 2,500 sf requiring a building or landscape permit (5.304.3).
- Commissioning. For new buildings 10,000 sf and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements (5.410.2).
- Additionally, under California's 2022 Title 24, Part 6 Building Energy Efficiency Standards, solar photovoltaic systems are required for newly constructed low-rise residential buildings and shall be sized sufficient to offset the electricity use of the proposed building as if it was a mixed-fuel building.

3.2.4 AB 1493 Pavley Regulations and Fuel Efficiency Standards

California AB 1493, enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Under this legislation, CARB adopted regulations to reduce GHG emissions from non-commercial passenger vehicles (cars and light-duty trucks). Although aimed at reducing GHG emissions, specifically, a co-benefit of the Pavley standards is an improvement in fuel efficiency and consequently a reduction in fuel consumption.

3.2.5 California's Renewable Portfolio Standard (RPS)

First established in 2002 under Senate Bill (SB) 1078, California's Renewable Portfolio Standards (RPS) requires retail sellers of electric services to increase procurement from eligible renewable resources to 33% of total retail sales by 2020 (26).

3.2.6 Clean Energy and Pollution Reduction Act of 2015 (SB 350)

In October 2015, the legislature approved, and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33% to 50% by 2030, with interim targets of 40% by 2024, and 25% by 2027.

- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States (California Leginfo 2015).

3.2.7 100 PERCENT CLEAN ENERGY ACT OF 2018 (SB 100)

In September 2018, the legislature approved, and the Governor signed SB 100, which builds on the targets established in SB 1078 and SB 350. Most notably, SB 100 sets a goal of powering all retail electricity sold in California with renewable and zero-carbon resources. Additionally, SB 100 updates the interim renewables target from 50% to 60% by 2030.

3.2.8 EXECUTIVE ORDER N-79-20 AND ADVANCED CLEAN CARS II

On August 25, 2022 CARB approved the Advanced Clean Cars II rule, which codifies the goals set out in Executive Order N-79-20 and establishes a year-by-year roadmap such that by 2035, 100% of new cars and light trucks sold in California will be zero-emission vehicles. Under this regulation, automakers are required to accelerate deliveries of zero-emission light-duty vehicles, beginning with model year 2026. CARB estimates that between 2026 and 2040, the regulation would reduce GHG emissions by a cumulative 395 million metric tons, equivalent to reducing petroleum use by 915 million barrels.

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4 PROJECT ENERGY DEMANDS AND ENERGY EFFICIENCY MEASURES

4.1 EVALUATION CRITERIA

Per Appendix F of the *State CEQA Guidelines* (27), states that the means of achieving the goal of energy conservation includes the following:

- Decreasing overall per capita energy consumption;
- Decreasing reliance on fossil fuels such as coal, natural gas, and oil; and
- Increasing reliance on renewable energy sources.

In compliance with Appendix G of the *State CEQA Guidelines* (28), this report analyzes the project's anticipated energy use during construction and operations to determine if the Project would:

- Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

4.2 METHODOLOGY

Information from the CalEEMod Version 2022.1 outputs for the *Arroyo Vista Air Quality Impact Analysis* (AQIA) (29) was utilized in this analysis, detailing Project related construction equipment, transportation energy demands, and facility energy demands.

CONSTRUCTION DURATION

Construction is anticipated to begin in June 2024 and will last through December 2027 (29). The construction schedule utilized in the analysis, shown in Table 4-1, represents a "worst-case" analysis scenario. The duration of construction activity and associated equipment represents a reasonable approximation of the expected construction fleet as required per *CEQA Guidelines* (30).

CONSTRUCTION EQUIPMENT

Consistent with industry standards and typical construction practices, each piece of equipment listed in Table 4-2 will operate up to a total of eight (8) hours per day, or more than two-thirds of the period during which construction activities are allowed pursuant to the code. The equipment list is generally based on CalEEMod default parameters and confirmed with the Project Applicant. It should be noted that the construction equipment presented on Table 4-2 will be used for the duration of both Phase 1 and Phase 2.

TABLE 4-1: CONSTRUCTION DURATION

Construction Activity	Start Date	End Date	Days
Phase 1			
Demolition	6/3/2024	7/31/2024	22
Site Preparation	8/1/2024	8/31/2024	22
Grading	9/2/2024	4/4/2025	155
Building Construction	3/3/2025	12/31/2026	479
Paving	5/1/2025	10/1/2025	110
Architectural Coating	6/2/2025	10/31/2025	110
Phase 2			
Demolition	12/2/2024	1/31/2025	45
Site Preparation	2/3/2025	2/28/2025	20
Grading	3/3/2025	6/13/2025	75
Building Construction	9/1/2025	12/31/2027	610
Paving	7/1/2025	9/15/2025	55
Architectural Coating	8/1/2025	10/16/2025	55

Source: Appendices 4.1 and 4.2.

TABLE 4-2: CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Activity	Equipment[1]	Amount	Hours Per Day
Demolition	Concrete/Industrial Saws	1	8
	Excavators	3	8
	Rubber Tired Dozers	2	8
Site Preparation	Crawler Tractors	4	8
	Rubber Tired Dozers	3	8
Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Crawler Tractors	2	8
	Bore/Drill Rigs	1	8
	Generator Set	1	8

Construction Activity	Equipment[1]	Amount	Hours Per Day
Building Construction	Cranes	1	8
	Forklifts	3	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	3	8
	Welders	1	8
Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Architectural Coating	Air Compressors	1	8

[1] In order to account for fugitive dust emissions, Crawler Tractors were used in lieu of Tractors/Loaders/Backhoes during the site preparation and grading phases.

4.2.1 CalEEMod

In May 2022, the California Air Pollution Control Officers Association (CAPCOA) in conjunction with other California air districts, including the SCAQMD, released the latest version of CalEEMod, version 2022.1. The purpose of this model is to calculate construction-source and operational-source criteria pollutants and GHG emissions from direct and indirect sources as well as energy usage (31). Accordingly, the latest version of CalEEMod has been used to determine the proposed Project's anticipated transportation and facility energy demands. Outputs from the annual model runs are provided in Appendices 4.1, 4.2 and 4.3.

4.2.2 Emission Factors Model

On May 2, 2022, the EPA approved the 2021 version of the EMissions FACtor model (EMFAC) web database for use in State Implementation Plan and transportation conformity analyses. EMFAC2021 is a mathematical model that was developed to calculate emission rates, fuel consumption, VMT from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the CARB to project changes in future emissions from on-road mobile sources (32). This energy study utilizes the different fuel types for each vehicle class from the annual EMFAC2021 emission inventory in order to derive the average vehicle fuel economy which is then used to determine the estimated annual fuel consumption associated with vehicle usage during Project construction and operational activities. For purposes of the analysis, the 2024, 2025, 2026, and 2027 analysis years were utilized to determine the average vehicle fuel economy used throughout the duration of the Project. Output from the EMFAC2021 model runs are provided in Appendix 4.4.

4.3 Construction Energy Demands

The focus within this section is the energy implications of the construction process, specifically the power cost from on-site electricity consumption during construction of the proposed Project.

4.3.1 CONSTRUCTION POWER COST

The total Project construction power costs is the summation of the products of the area (sf) by the construction duration and the typical power cost.

PROJECT CONSTRUCTION POWER COST

The *2023 National Construction Estimator* identifies a typical power cost per 1,000 sf of construction per month of $2.50, which was used to calculate the Project's total construction power cost (33).

As shown on Table 4-3, the total power cost of the on-site electricity usage during the construction of the Project is estimated to be approximately $488,717.10.

TABLE 4-3: CONSTRUCTION POWER COST

Land Use	Power Cost (per 1,000 SF)	Size (1,000 SF)	Construction Duration (months)	Project Construction Power Cost
Phase 1				
Single Family Housing	$2.50	1,977.624	30	$148,321.80
Other Non-Asphalt Surfaces	$2.50	2,256.408	30	$169,230.60
Phase 2				
Single Family Housing	$2.50	1,846.944	36	$166,224.96
Other Non-Asphalt Surfaces	$2.50	54.886	36	$4,939.74
CONSTRUCTION POWER COST				***$488,717.10***

4.3.2 CONSTRUCTION ELECTRICITY USAGE

The total Project construction electricity usage is the summation of the products of the power cost (estimated in Table 4-3) by the utility provider cost per kilowatt hour (kWh) of electricity.

PROJECT CONSTRUCTION ELECTRICITY USAGE

The SCE's general service rate schedule were used to determine the Project's electrical usage. As of January 1, 2023, SCE's general service rate is $0.16 per kilowatt hours (kWh) of electricity for residential services (34). As shown on Table 4-4, the total electricity usage from on-site Project construction related activities is estimated to be approximately 3,113,443 kWh.

TABLE 4-4: CONSTRUCTION ELECTRICITY USAGE

Land Use	Cost per kWh	Project Construction Electricity Usage (kWh)
Phase 1		
Single Family Housing	$0.16	944,905
Other Non-Asphalt Surfaces	$0.16	1,078,108
Phase 2		
Single Family Housing	$0.16	1,058,960
Other Non-Asphalt Surfaces	$0.16	31,469
CONSTRUCTION ELECTRICITY USAGE		***3,113,443***

4.3.3 CONSTRUCTION EQUIPMENT FUEL ESTIMATES

Fuel consumed by construction equipment would be the primary energy resource expended over the course of Project construction.

PROJECT CONSTRUCTION EQUIPMENT FUEL CONSUMPTION

Project construction activity timeline estimates, construction equipment schedules, equipment power ratings, load factors, and associated fuel consumption estimates are presented in Table 4-5. The aggregate fuel consumption rate for all equipment is estimated at 18.5 horsepower hour per gallon (hp-hr-gal.), obtained from CARB 2018 Emissions Factors Tables and cited fuel consumption rate factors presented in Table D-24 of the Moyer guidelines (35). For the purposes of this analysis, the calculations are based on all construction equipment being diesel-powered which is consistent with industry standards. Diesel fuel would be supplied by existing commercial fuel providers serving the Project area and region[3]. As presented in Table 4-5, Project construction activities would consume an estimated 258,475 gallons of diesel fuel. Project construction would represent a "single-event" diesel fuel demand and would not require on-going or permanent commitment of diesel fuel resources for this purpose.

[3] Based on Appendix A of the CalEEMod User's Guide, Construction consists of several types of off-road equipment. Since the majority of the off-road construction equipment used for construction projects are diesel fueled, CalEEMod assumes all of the equipment operates on diesel fuel.

TABLE 4-5: CONSTRUCTION EQUIPMENT FUEL CONSUMPTION ESTIMATES

Activity/Duration	Duration (Days)	Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption (gal. diesel fuel)
Phase 1								
Demolition	43	Rubber Tired Dozers	367	2	8	0.4	2,349	5,459
		Excavators	36	3	8	0.38	328	763
		Concrete/Industrial Saws	33	1	8	0.73	193	448
Site Preparation	22	Rubber Tired Dozers	367	3	8	0.4	3,523	4,190
		Crawler Tractors	87	4	8	0.43	1,197	1,424
Grading	155	Excavators	36	2	8	0.38	219	1,834
		Graders	148	1	8	0.41	485	4,067
		Rubber Tired Dozers	367	1	8	0.4	1,174	9,840
		Scrapers	423	2	8	0.48	3,249	27,218
		Crawler Tractors	87	2	8	0.43	599	5,015
		Bore/Drill Rigs	83	1	8	0.5	332	2,782
		Generator Sets	300	1	8	0.48	1,152	9,652
Building Construction	479	Cranes	367	1	8	0.29	851	22,045
		Forklifts	82	3	8	0.2	394	10,191
		Generator Sets	14	1	8	0.74	83	2,146
		Tractors/Loaders/Backhoes	84	3	8	0.37	746	19,313
		Welders	46	1	8	0.45	166	4,288
Paving	110	Pavers	81	2	8	0.42	544	3,236
		Paving Equipment	89	2	8	0.36	513	3,048
		Rollers	36	2	8	0.38	219	1,301
Architectural Coating	110	Air Compressors	37	1	8	0.48	142	845

Activity/Duration	Duration (Days)	Equipment	HP Rating	Quantity	Usage Hours	Load Factor	HP-hrs/day	Total Fuel Consumption (gal. diesel fuel)
Phase 2								
Demolition	45	Rubber Tired Dozers	367	2	8	0.4	2,349	5,713
		Excavators	36	3	8	0.38	328	799
		Concrete/Industrial Saws	33	1	8	0.73	193	469
Site Preparation	20	Rubber Tired Dozers	367	3	8	0.4	3,523	3,809
		Crawler Tractors	87	4	8	0.43	1,197	1,294
Grading	75	Excavators	36	2	8	0.38	219	887
		Graders	148	1	8	0.41	485	1,968
		Rubber Tired Dozers	367	1	8	0.4	1,174	4,761
		Scrapers	423	2	8	0.48	3,249	13,170
		Crawler Tractors	87	2	8	0.43	599	2,427
		Bore/Drill Rigs	83	1	8	0.5	332	1,346
		Generator Sets	300	1	8	0.48	1,152	4,670
Building Construction	610	Cranes	367	1	8	0.29	851	28,075
		Forklifts	82	3	8	0.2	394	12,978
		Generator Sets	14	1	8	0.74	83	2,733
		Tractors/Loaders/Backhoes	84	3	8	0.37	746	24,595
		Welders	46	1	8	0.45	166	5,460
Paving	55	Pavers	81	2	8	0.42	544	1,618
		Paving Equipment	89	2	8	0.36	513	1,524
		Rollers	36	2	8	0.38	219	651
Architectural Coating	55	Air Compressors	37	1	8	0.48	142	422
TOTAL CONSTRUCTION FUEL DEMAND (GALLONS DIESEL FUEL)								***258,475***

4.3.3 CONSTRUCTION TRIPS AND VMT

Construction generates on-road vehicle emissions from vehicle usage for workers, hauling, and vendors commuting to and from the site. The number of workers, hauling, and vendor trips are presented below in Table 4-6. It should be noted that for Vendor Trips, specifically, CalEEMod only assigns Vendor Trips to the Building Construction phase. Vendor trips are more likely to occur during all phases of construction. As such, the analysis has been revised so that the default trips are ratioed between Demolition, Site Preparation, Grading, Building Construction, Paving and Architectural Coating activities based on the number of days. It should be noted that for Phase 1, because Paving and Architectural Coating activities overlap with Building Construction, the analysis assumes that the vendor trips assigned to Building Construction cover Paving and Architectural Coating as well.

TABLE 4-6: CONSTRUCTION TRIPS AND VMT

Phase Name	Worker Trips / Day	Vendor Trips / Day	Hauling Trips / Day	Worker Trip Length	Vendor Trip Length	Hauling Trip Length
Phase 1						
Demolition	15	1	22	18.5	10.2	20
Site Preparation	18	0	0	18.5	10.2	20
Grading	20	3	0	18.5	10.2	20
Building Construction	44	9	0	18.5	10.2	20
Paving	15	0	0	18.5	10.2	20
Architectural Coating	9	0	0	18.5	10.2	20
Phase 2						
Demolition	15	1	0	18.5	10.2	20
Site Preparation	18	0	0	18.5	10.2	20
Grading	20	1	0	18.5	10.2	20
Building Construction	40	9	0	18.5	10.2	20
Paving	15	0	0	18.5	10.2	20
Architectural Coating	8	0	0	18.5	10.2	20

4.3.4 CONSTRUCTION WORKER FUEL ESTIMATES

With respect to estimated VMT for the Project, the construction worker trips would generate an estimated 1,089,706 VMT during the 42 months of construction (29). Based on CalEEMod methodology, it is assumed that 50% of all worker trips are from light-duty-auto vehicles (LDA), 25% are from light-duty-trucks (LDT1[4]), and 25% are from light-duty-trucks (LDT2[5]). Data regarding Project related construction worker trips were based on CalEEMod defaults utilized within the AQIA.

[4] Vehicles under the LDT1 category have a gross vehicle weight rating (GVWR) of less than 6,000 lbs. and equivalent test weight (ETW) of less than or equal to 3,750 lbs.

[5] Vehicles under the LDT2 category have a GVWR of less than 6,000 lbs. and ETW between 3,751 lbs. and 5,750 lbs.

Vehicle fuel efficiencies for LDA, LDT1, and LDT2 were estimated using information generated within the 2021 version of the EMFAC developed by CARB. EMFAC2021 is a mathematical model that was developed to calculate emission rates, fuel consumption, and VMT from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the CARB to project changes in future emissions from on-road mobile sources (32). EMFAC2021 was run for the LDA, LDT1, and LDT2 vehicle class within the Riverside South Coast sub-area for the 2024, 2025, 2026, 2027 calendar years. Data from EMFAC2021 is shown in Appendix 4.4.

Table 4-7 provides an estimated annual fuel consumption resulting from Project construction worker trips. Based on Table 4-7, it is estimated that 37,764 gallons of fuel will be consumed related to construction worker trips during full construction of the Project.

TABLE 4-7: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES (LDA) (1 OF 3)

Construction Activity	Duration (Days)	Worker LDA Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	8	18.5	6,364	31.51	202
Site Preparation	22	9	18.5	3,663	31.51	116
Grading	87	10	18.5	16,095	31.51	511
2025						
Grading	68	10	18.5	12,580	32.49	387
Building Construction	218	22	18.5	88,726	32.49	2,731
Paving	110	8	18.5	16,280	32.49	501
Architectural Coating	110	5	18.5	10,175	32.49	313
2026						
Building Construction	261	22	18.5	106,227	33.43	3,177
Phase 2						
2024						
Demolition	43	8	18.5	6,364	31.51	202
2025						
Demolition	23	8	18.5	3,404	32.49	105
Site Preparation	20	9	18.5	3,330	32.49	102
Grading	75	10	18.5	13,875	32.49	427
Building Construction	88	21	18.5	34,188	32.49	1,052
Paving	55	8	18.5	8,140	32.49	251
Architectural Coating	55	5	18.5	5,088	32.49	157
2026						
Building Construction	261	21	18.5	101,399	33.43	3,033
2027						
Building Construction	261	21	18.5	101,399	34.29	2,957

TABLE 4-7: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES (LDT1) (2 OF 3)

Construction Activity	Duration (Days)	Worker LDT1 Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	4	18.5	3,182	24.62	129
Site Preparation	22	5	18.5	2,035	24.62	83
Grading	87	5	18.5	8,048	24.62	327
2025						
Grading	68	5	18.5	6,290	25.14	250
Building Construction	218	11	18.5	44,363	25.14	1,765
Paving	110	4	18.5	8,140	25.14	324
Architectural Coating	110	3	18.5	6,105	25.14	243
2026						
Building Construction	261	11	18.5	53,114	25.70	2,066
Phase 2						
2024						
Demolition	43	4	18.5	3,182	24.62	129
2025						
Demolition	23	4	18.5	1,702	25.14	68
Site Preparation	20	5	18.5	1,850	25.14	74
Grading	75	5	18.5	6,938	25.14	276
Building Construction	88	11	18.5	17,908	25.14	712
Paving	55	4	18.5	4,070	25.14	162
Architectural Coating	55	3	18.5	3,053	25.14	121
2026						
Building Construction	261	11	18.5	53,114	25.70	2,066
2027						
Building Construction	261	11	18.5	53,114	26.22	2,026

TABLE 4-7: CONSTRUCTION WORKER FUEL CONSUMPTION ESTIMATES (LDT2) (3 OF 3)

Construction Activity	Duration (Days)	Worker LDT2 Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	4	18.5	3,182	24.57	129
Site Preparation	22	5	18.5	2,035	24.57	83
Grading	87	5	18.5	8,048	24.57	328

Construction Activity	Duration (Days)	Worker LDT2 Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
2025						
Grading	68	5	18.5	6,290	25.29	249
Building Construction	218	11	18.5	44,363	25.29	1,754
Paving	110	4	18.5	8,140	25.29	322
Architectural Coating	110	3	18.5	6,105	25.29	241
2026						
Building Construction	261	11	18.5	53,114	26.01	2,042
Phase 2						
2024						
Demolition	43	4	18.5	3,182	24.57	129
2025						
Demolition	23	4	18.5	1,702	25.29	67
Site Preparation	20	5	18.5	1,850	25.29	73
Grading	75	5	18.5	6,938	25.29	274
Building Construction	88	11	18.5	17,908	25.29	708
Paving	55	4	18.5	4,070	25.29	161
Architectural Coating	55	3	18.5	3,053	25.29	121
2026						
Building Construction	261	11	18.5	53,114	26.01	2,042
2027						
Building Construction	261	11	18.5	53,114	26.63	1,995
TOTAL CONSTRUCTION WORKER (LDA, LDT1, LDT2) FUEL CONSUMPTION						**37,764**

It should be noted that construction worker trips would represent a "single-event" gasoline fuel demand and would not require on-going or permanent commitment of fuel resources for this purpose.

4.3.5 CONSTRUCTION VENDOR/HAULING FUEL ESTIMATES

With respect to estimated VMT, the construction vendor trips (vehicles that deliver materials to the site during construction) would generate an estimated 123,171 VMT along area roadways for the Project over the duration of construction activity (29). It is assumed that 50% of all vendor trips are from medium-heavy duty trucks (MHDT), 50% of vendor trips are from heavy-heavy duty trucks (HHDT), and 100% of all hauling trips are from HHDTs. These assumptions are consistent with the CalEEMod defaults utilized within the within the AQIA (29). Vehicle fuel efficiencies for MHDTs and HHDTs were estimated using information generated within EMFAC2021. EMFAC2021 was run for the MHDT and HHDT vehicle classes within the Riverside South Coast sub-area for the 2024, 2025, 2026, 2027 calendar years. Data from EMFAC2021 is shown in Appendix 4.4.

Based on Table 4-8, it is estimated that 16,940 gallons of fuel will be consumed related to construction vendor trips during full construction of the Project.

TABLE 4-8: CONSTRUCTION VENDOR FUEL CONSUMPTION ESTIMATES (MHDT) (1 OF 3)

Construction Activity	Duration (Days)	Worker LDA Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	1	10.2	439	8.49	52
Site Preparation	22	1	10.2	224	8.49	26
Grading	87	2	10.2	1,775	8.49	209
2025						
Grading	68	2	10.2	1,387	8.60	161
Building Construction	218	5	10.2	11,118	8.60	1,293
2026						
Building Construction	261	5	10.2	13,311	8.72	1,526
Phase 2						
2024						
Demolition	43	1	10.2	439	8.49	52
2025						
Demolition	23	1	10.2	235	8.60	27
Site Preparation	20	1	10.2	204	8.60	24
Grading	75	1	10.2	765	8.60	89
Architectural Coating	55	5	10.2	2,805	8.60	326
2026						
Building Construction	261	5	10.2	13,311	8.72	1,526
2027						
Building Construction	261	5	10.2	13,311	8.87	1,500

TABLE 4-8: CONSTRUCTION VENDOR FUEL CONSUMPTION ESTIMATES (VENDOR HHDT) (2 OF 3)

Construction Activity	Duration (Days)	Worker LDA Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	1	10.2	439	6.12	72
Site Preparation	22	1	10.2	224	6.12	37
Grading	87	2	10.2	1,775	6.12	290
2025						
Grading	68	2	10.2	1,387	8.60	161
Building Construction	218	5	10.2	11,118	8.60	1,293
2026						

Construction Activity	Duration (Days)	Worker LDA Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Building Construction	261	5	10.2	13,311	8.72	1,526
Phase 2						
2024						
Demolition	43	1	10.2	439	6.12	72
2025						
Demolition	23	1	10.2	235	6.22	38
Site Preparation	20	1	10.2	204	6.22	33
Grading	75	1	10.2	765	6.22	123
Building Construction	88	5	10.2	4,488	6.22	722
Paving	55	1	10.2	561	6.22	90
Architectural Coating	55	1	10.2	561	6.22	90
2026						
Building Construction	261	5	10.2	13,311	6.33	2,104
2027						
Building Construction	261	5	10.2	13,311	6.45	2,063

TABLE 4-8: CONSTRUCTION VENDOR FUEL CONSUMPTION ESTIMATES (HAULING HHDT) (3 OF 3)

Construction Activity	Duration (Days)	Worker LDT2 Trips / Day	Trip Length (miles)	Vehicle Miles Traveled	Average Vehicle Fuel Economy (mpg)	Estimated Fuel Consumption (gallons)
Phase 1						
2024						
Demolition	43	2	20	1,720	6.12	281
TOTAL CONSTRUCTION WORKER (MHDT, VENDOR HHDT, HAULING HHDT) FUEL CONSUMPTION						***16,940***

It should be noted that Project construction vendor trips would represent a "single-event" diesel fuel demand and would not require on-going or permanent commitment of diesel fuel resources for this purpose.

4.3.6 CONSTRUCTION ENERGY EFFICIENCY/CONSERVATION MEASURES

Starting in 2014, CARB adopted the nation's first regulation aimed at cleaning up off-road construction equipment such as bulldozers, graders, and backhoes. These requirements ensure fleets gradually turnover the oldest and dirtiest equipment to newer, cleaner models and prevent fleets from adding older, dirtier equipment. As such, the equipment used for Project construction would conform to CARB regulations and California emissions standards. It should also be noted that there are no unusual Project characteristics or construction processes that would require the use of equipment that would be more energy intensive than is used for comparable activities; or equipment that would not conform to current emissions standards (and related fuel

efficiencies). Equipment employed in construction of the Project would therefore not result in inefficient wasteful, or unnecessary consumption of fuel.

Construction contractors would be required to comply with applicable CARB regulation regarding retrofitting, repowering, or replacement of diesel off-road construction equipment. Additionally, CARB has adopted the Airborne Toxic Control Measure to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other Toxic Air Contaminants. Compliance with anti-idling and emissions regulations would result in a more efficient use of construction-related energy and the minimization or elimination of wasteful or unnecessary consumption of energy. Idling restrictions and the use of newer engines and equipment would result in less fuel combustion and energy consumption.

Additional construction-source energy efficiencies would occur due to required California regulations and best available control measures (BACM). For example, CCR Title 13, Motor Vehicles, section 2449(d)(3) Idling, limits idling times of construction vehicles to no more than five minutes, thereby precluding unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. Section 2449(d)(3) requires that grading plans shall reference the requirement that a sign shall be posted on-site stating that construction workers need to shut off engines at or before five minutes of idling." In this manner, construction equipment operators are required to be informed that engines are to be turned off at or prior to five minutes of idling. Enforcement of idling limitations is realized through periodic site inspections conducted by City building officials, and/or in response to citizen complaints.

4.4 OPERATIONAL ENERGY DEMANDS

Energy consumption in support of or related to Project operations would include transportation energy demands (energy consumed by passenger car and truck vehicles accessing the Project site) and facilities energy demands (energy consumed by building operations and site maintenance activities).

4.4.1 TRANSPORTATION ENERGY DEMANDS

Energy that would be consumed by Project-generated traffic is a function of total VMT and estimated vehicle fuel economies of vehicles accessing the Project site. The VMT per vehicle class can be determined by evaluated in the vehicle fleet mix and the total VMT.

As with worker and vendors trips, operational vehicle fuel efficiencies were estimated using information generated within EMFAC2021 developed by CARB (32). EMFAC2021 was run for the Riverside South Coast sub-area for calendar years 2024, 2025, 2026, 2027. Data from EMFAC2021 is shown in Appendix 4.4.

As summarized on Table 4-9 the Project will result in 8,735,466 annual VMT and an estimated annual fuel consumption of 334,817 gallons of fuel.

TABLE 4-9: TOTAL PROJECT-GENERATED TRAFFIC ANNUAL FUEL CONSUMPTION

Vehicle Type	Annual Miles Traveled[1]	Average Vehicle Fuel Economy (mpg)	Estimated Annual Fuel Consumption (gallons)
LDA	4,329,740	34.29	126,283
LDT1	323,067	26.22	12,322
LDT2	1,821,355	26.63	68,401
MDV	1,371,864	21.39	64,136
LHD1	269,871	17.30	15,599
LHD2	77,119	16.30	4,732
MHDT	129,971	8.87	14,646
HHDT	143,344	6.45	22,221
OBUS	5,173	6.88	752
UBUS	3,348	4.56	735
MCY	199,228	42.17	4,725
SBUS	11,648	6.46	1,804
MH	49,736	5.88	8,461
TOTAL (ALL VEHICLES)	***8,735,466***		***334,817***

[1] Total VMT may not match CalEEMod output due to rounding.

4.4.2 ENERGY DEMANDS

The Project operational activities would result in the consumption of natural gas and electricity. Natural gas would be supplied to the Project by SoCalGas; electricity would be supplied to the Project by SCE. As previously stated, the analysis herein assumes compliance with the 2022 Title 24 and CALGreen standards. Annual natural gas and electricity demands of the Project are summarized in Table 4-10 and provided in Appendix 4.3.

TABLE 4-10: PROJECT ANNUAL OPERATIONAL NATURAL GAS DEMAND SUMMARY

Land Use	Natural Gas Demand (kBTU/year)	Electricity Demand (kWh/year)
Single Family Housing	8,286,485	2,176,044
TOTAL PROJECT ENERGY DEMAND	***8,286,485***	***2,176,044***

kBTU – kilo-British Thermal Units

4.4.3 OPERATIONAL ENERGY EFFICIENCY/CONSERVATION MEASURES

Energy efficiency/energy conservation attributes of the Project would be complemented by increasingly stringent state and federal regulatory actions addressing vehicle fuel economies and vehicle emissions standards; and enhanced building/utilities energy efficiencies mandated under California building codes (e.g., Title 24, California Green Building Standards Code).

ENHANCED VEHICLE FUEL EFFICIENCIES

Project annual fuel consumption estimates presented previously in Table 4-9 represent likely potential maximums that would occur for the Project. Under subsequent future conditions, average fuel economies of vehicles accessing the Project site can be expected to improve as older, less fuel-efficient vehicles are removed from circulation, and in response to fuel economy and emissions standards imposed on newer vehicles entering the circulation system.

Enhanced fuel economies realized pursuant to federal and state regulatory actions, and related transition of vehicles to alternative energy sources (e.g., electricity, natural gas, biofuels, hydrogen cells) would likely decrease future gasoline fuel demands per VMT. Location of the Project proximate to regional and local roadway systems tends to reduce VMT within the region, acting to reduce regional vehicle energy demands.

4.5 SUMMARY

4.5.1 CONSTRUCTION ENERGY DEMANDS

The estimated power cost of on-site electricity usage during the construction of the Project is assumed to be approximately $488,717.10. Additionally, based on the assumed power cost, it is estimated that the total electricity usage during construction, after full Project build-out, is calculated to be approximately 3,113,443 kWh.

Construction equipment used by the Project would result in single event consumption of approximately 258,475 gallons of diesel fuel. Construction equipment use of fuel would not be atypical for the type of construction proposed because there are no aspects of the Project's proposed construction process that are unusual or energy-intensive, and Project construction equipment would conform to the applicable CARB emissions standards, acting to promote equipment fuel efficiencies.

CCR Title 13, Title 13, Motor Vehicles, section 2449(d)(3) Idling, limits idling times of construction vehicles to no more than 5 minutes, thereby precluding unnecessary and wasteful consumption of fuel due to unproductive idling of construction equipment. BACMs inform construction equipment operators of this requirement. Enforcement of idling limitations is realized through periodic site inspections conducted by City building officials, and/or in response to citizen complaints.

Construction worker trips for full construction of the Project would result in the estimated fuel consumption of 37,764 gallons of fuel. Additionally, fuel consumption from construction hauling and vendor trips (MHDTs and HHDTs) will total approximately 16,940 gallons. Diesel fuel would be supplied by City and regional commercial vendors. Indirectly, construction energy efficiencies and energy conservation would be achieved using bulk purchases, transport and use of construction materials. The 2022 IEPR released by the CEC has shown that fuel efficiencies are getting better within on and off-road vehicle engines due to more stringent government requirements (23). As supported by the preceding discussions, Project construction energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

4.5.2 OPERATIONAL ENERGY DEMANDS

TRANSPORTATION ENERGY DEMANDS

Annual vehicular trips and related VMT generated by the operation of the Project would result in a fuel demand of 334,817 gallons of fuel.

Fuel would be provided by current and future commercial vendors. Trip generation and VMT generated by the Project are consistent with other single-family and attached residential and middle school uses of similar scale and configuration, as reflected respectively in the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Ed., 2021); and CalEEMod. As such, Project operations would not result in excessive and wasteful vehicle trips and VMT, nor excess and wasteful vehicle energy consumption compared to similar uses.

It should be noted that the state strategy for the transportation sector for medium and heavy-duty trucks is focused on making trucks more efficient and expediting truck turnover rather than reducing VMT from trucks. This is in contrast to the passenger vehicle component of the transportation sector where both per-capita VMT reductions and an increase in vehicle efficiency are forecasted to be needed to achieve the overall state emissions reductions goals.

Enhanced fuel economies realized pursuant to federal and state regulatory actions, and related transition of vehicles to alternative energy sources (e.g., electricity, natural gas, biofuels, hydrogen cells) would likely decrease future gasoline fuel demands per VMT. Location of the Project proximate to regional and local roadway systems tends to reduce VMT within the region, acting to reduce regional vehicle energy demands. The Project would implement sidewalks, facilitating and encouraging pedestrian access. Facilitating pedestrian and bicycle access would reduce VMT and associated energy consumption. As supported by the preceding discussions, Project transportation energy consumption would not be considered inefficient, wasteful, or otherwise unnecessary.

FACILITY ENERGY DEMANDS

Project facility operational energy demands are estimated at 8,286,485 kBTU/year of natural gas and 2,176,044 kWh/year of electricity. Natural gas would be supplied to the Project by SoCalGas; electricity would be supplied by SCE. The Project proposes conventional residential and educational reflecting contemporary energy efficient/energy conserving designs and operational programs. The Project does not propose uses that are inherently energy intensive and the energy demands in total would be comparable to other residential and educational uses of similar scale and configuration.

Lastly, the Project will comply with the applicable Title 24 standards. Compliance itself with applicable Title 24 standards will ensure that the Project energy demands would not be inefficient, wasteful, or otherwise unnecessary.

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5 CONCLUSIONS

5.1 ENERGY IMPACT 1

Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

As supported by the preceding analyses, Project construction and operations would not result in the inefficient, wasteful, or unnecessary consumption of energy. The Project would therefore not cause or result in the need for additional energy producing or transmission facilities. The Project would not engage in wasteful or inefficient uses of energy and aims to achieve energy conservations goals within the State of California.

5.2 ENERGY IMPACT 2

Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The Project's consistency with the applicable state and local plans is discussed below.

CONSISTENCY WITH ISTEA

Transportation and access to the Project site is provided by the local and regional roadway systems. The Project would not interfere with, nor otherwise obstruct intermodal transportation plans or projects that may be realized pursuant to the ISTEA because SCAG is not planning for intermodal facilities on or through the Project site.

CONSISTENCY WITH TEA-21

The Project site is located in an area with proximate access to the Interstate freeway system. The site selected for the Project facilitates access, acts to reduce vehicle miles traveled, takes advantage of existing infrastructure systems, and promotes land use compatibilities through collocation of similar uses. The Project supports the strong planning processes emphasized under TEA-21. The Project is therefore consistent with, and would not otherwise interfere with, nor obstruct implementation of TEA-21.

CONSISTENCY WITH IEPR

Electricity would be provided to the Project by SCE. SCE's *Clean Power and Electrification Pathway* (CPEP) white paper builds on existing state programs and policies. As such, the Project is consistent with, and would not otherwise interfere with, nor obstruct implementation the goals presented in the 2022 IEPR.

Additionally, the Project will comply with the applicable Title 24 standards which would ensure that the Project energy demands would not be inefficient, wasteful, or otherwise unnecessary. As such, development of the proposed Project would support the goals presented in the 2022 IEPR.

CONSISTENCY WITH STATE OF CALIFORNIA ENERGY PLAN

The Project site is located in an area with proximate access to the Interstate freeway system. The site selected for the Project facilitates access and takes advantage of existing infrastructure systems. The Project therefore supports urban design and planning processes identified under the State of California Energy Plan, is consistent with, and would not otherwise interfere with, nor obstruct implementation of the State of California Energy Plan.

CONSISTENCY WITH CALIFORNIA CODE TITLE 24, PART 6, ENERGY EFFICIENCY STANDARDS

The 2022 version of Title 24 was adopted by the CEC and will become effective on January 1, 2023. As the Project building construction is anticipated in 2024, it is presumed that the Project would be required to comply with the Title 24 standards in place at that time. Therefore, the Project is would not result in a significant impact on energy resources (36). The proposed Project would be subject to Title 24 standards.

CONSISTENCY WITH CALIFORNIA CODE TITLE 24, PART 11, CALGREEN

As previously stated, CCR, Title 24, Part 11: CALGreen is a comprehensive and uniform regulatory code for all residential, commercial, and school buildings that went in effect on January 1, 2009, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis, with the most recent approved update consisting of the 2022 California Green Building Code Standards that were published on July 1, 2022 and will become effective on January 1, 2023. The Project would be required to comply with the applicable standards in place at the time plan check submittals are made.

CONSISTENCY WITH AB 1493

AB 1493 is not applicable to the Project as it is a statewide measure establishing vehicle emissions standards. No feature of the Project would interfere with implementation of the requirements under AB 1493.

CONSISTENCY WITH RPS

California's RPS is not applicable to the Project as it is a statewide measure that establishes a renewable energy mix. No feature of the Project would interfere with implementation of the requirements under RPS.

CONSISTENCY WITH SB 350 AND SB 100

The proposed Project would use energy from SCE, which have committed to diversify their portfolio of energy sources by increasing energy from wind and solar sources. No feature of the Project would interfere with implementation of SB 350 and SB 100. Additionally, the Project would be designed and constructed to implement the energy efficiency measures for new residential and educational developments and would include several measures designed to reduce energy consumption in accordance with Title 24.

As shown above, the Project would not conflict with any of the state or local plans. As such, a less than significant impact is expected.

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7 CERTIFICATIONS

The contents of this energy analysis report represent an accurate depiction of the environmental impacts associated with the proposed Arroyo Vista. The information contained in this energy analysis report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at hqureshi@urbanxroads.com.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August 2007
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APPENDIX 4.1:

CALEEMOD CONSTRUCTION PHASE 1 EMISSIONS MODEL OUTPUTS

14577 - Arroyo Vista Phase 1 Construction (Crushing/Blasting) Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	14577 - Arroyo Vista Phase 1 Construction (Crushing/Blasting)
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	10.0
Location	33.892195, -117.349735
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5476
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	121	Dwelling Unit	45.4	235,950	1,417,256	—	391	—
Other Non-Asphalt Surfaces	51.8	Acre	51.8	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.82	21.6	50.7	55.4	0.11	2.25	5.89	8.15	2.07	2.74	4.81	—	12,399	12,399	0.50	0.18	4.57	12,469
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.78	21.6	50.8	54.1	0.11	2.21	3.94	6.16	2.04	1.25	3.29	—	12,321	12,321	0.50	0.18	0.12	12,387
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.31	7.71	16.9	20.9	0.04	0.75	1.16	1.91	0.69	0.43	1.12	—	4,299	4,299	0.17	0.08	1.06	4,327
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.42	1.41	3.08	3.81	0.01	0.14	0.21	0.35	0.13	0.08	0.20	—	712	712	0.03	0.01	0.18	716

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2024	5.67	4.77	45.0	40.2	0.08	2.25	5.89	8.15	2.07	2.74	4.81	—	8,889	8,889	0.36	0.09	1.68	8,928
2025	6.82	21.6	50.7	55.4	0.11	2.21	3.94	6.16	2.04	1.25	3.29	—	12,399	12,399	0.50	0.18	4.57	12,469
2026	1.60	1.35	11.1	17.3	0.03	0.41	0.65	1.06	0.38	0.15	0.54	—	3,499	3,499	0.14	0.08	2.77	3,530
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	5.66	4.77	45.1	39.7	0.08	2.05	3.30	5.35	1.89	1.09	2.98	—	8,860	8,860	0.36	0.09	0.04	8,897
2025	6.78	21.6	50.8	54.1	0.11	2.21	3.94	6.16	2.04	1.25	3.29	—	12,321	12,321	0.50	0.18	0.12	12,387
2026	1.59	1.33	11.2	16.5	0.03	0.41	0.65	1.06	0.38	0.15	0.54	—	3,451	3,451	0.12	0.08	0.07	3,479
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	2.05	1.72	16.2	14.3	0.03	0.75	1.16	1.91	0.69	0.43	1.12	—	2,882	2,882	0.12	0.03	0.25	2,894
2025	2.31	7.71	16.9	20.9	0.04	0.72	1.08	1.80	0.66	0.31	0.97	—	4,299	4,299	0.17	0.08	1.06	4,327
2026	1.13	0.95	7.99	11.9	0.02	0.30	0.46	0.75	0.27	0.11	0.38	—	2,470	2,470	0.09	0.06	0.85	2,491
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.37	0.31	2.95	2.61	< 0.005	0.14	0.21	0.35	0.13	0.08	0.20	—	477	477	0.02	0.01	0.04	479
2025	0.42	1.41	3.08	3.81	0.01	0.13	0.20	0.33	0.12	0.06	0.18	—	712	712	0.03	0.01	0.18	716
2026	0.21	0.17	1.46	2.17	< 0.005	0.05	0.08	0.14	0.05	0.02	0.07	—	409	409	0.01	0.01	0.14	412

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.04	0.04	—	0.01	0.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.37	0.31	2.93	2.56	< 0.005	0.12	—	0.12	0.11	—	0.11	—	404	404	0.02	< 0.005	—	405
Demolition	—	—	—	—	—	—	0.01	0.01	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.07	0.06	0.54	0.47	< 0.005	0.02	—	0.02	0.02	—	0.02	—	66.8	66.8	< 0.005	< 0.005	—	67.0
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.08	0.07	1.25	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	216	216	0.01	0.01	0.86	219
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	24.8	24.8	< 0.005	< 0.005	0.07	26.0
Hauling	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	35.8	35.8	< 0.005	0.01	0.08	37.6

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.12	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	23.7	23.7	< 0.005	< 0.005	0.04	24.0
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.93	2.93	< 0.005	< 0.005	< 0.005	3.06
Hauling	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	4.22	4.22	< 0.005	< 0.005	< 0.005	4.43
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.02	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	3.92	3.92	< 0.005	< 0.005	0.01	3.97
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.48	0.48	< 0.005	< 0.005	< 0.005	0.51
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.70	0.70	< 0.005	< 0.005	< 0.005	0.73

3.3. Site Preparation (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.35	4.49	42.5	35.3	0.05	2.25	—	2.25	2.07	—	2.07	—	5,529	5,529	0.22	0.04	—	5,548
Dust From Material Movement	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.32	0.27	2.56	2.13	< 0.005	0.14	—	0.14	0.12	—	0.12	—	333	333	0.01	< 0.005	—	334
Dust From Material Movement	—	—	—	—	—	—	0.34	0.34	—	0.16	0.16	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.47	0.39	< 0.005	0.02	—	0.02	0.02	—	0.02	—	55.2	55.2	< 0.005	< 0.005	—	55.4
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.08	1.46	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	252	252	0.01	0.01	1.00	256
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	12.7	12.7	< 0.005	< 0.005	0.04	13.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	14.1	14.1	< 0.005	< 0.005	0.03	14.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.77	0.77	< 0.005	< 0.005	< 0.005	0.80

Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.34	2.34	< 0.005	< 0.005	< 0.005	2.37
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.13	0.13	< 0.005	< 0.005	< 0.005	0.13
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Grading (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.53	4.64	44.8	38.1	0.08	2.05	—	2.05	1.89	—	1.89	—	8,440	8,440	0.34	0.07	—	8,469
Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	5.53	4.64	44.8	38.1	0.08	2.05	—	2.05	1.89	—	1.89	—	8,440	8,440	0.34	0.07	—	8,469
Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.31	1.10	10.6	9.02	0.02	0.49	—	0.49	0.45	—	0.45	—	1,999	1,999	0.08	0.02	—	2,005
Dust From Material Movement	—	—	—	—	—	—	0.70	0.70	—	0.24	0.24	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.24	0.20	1.94	1.65	< 0.005	0.09	—	0.09	0.08	—	0.08	—	331	331	0.01	< 0.005	—	332
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.13	0.12	2.09	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	360	360	0.02	0.01	1.43	365
Vendor	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	89.4	89.4	< 0.005	0.01	0.25	93.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.12	0.14	1.58	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	331	331	0.02	0.01	0.04	335
Vendor	< 0.005	< 0.005	0.11	0.03	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	89.5	89.5	< 0.005	0.01	0.01	93.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.39	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	79.3	79.3	< 0.005	< 0.005	0.15	80.4
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	21.2	21.2	< 0.005	< 0.005	0.03	22.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.1	13.1	< 0.005	< 0.005	0.02	13.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.51	3.51	< 0.005	< 0.005	< 0.005	3.67
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.99	4.19	38.7	35.8	0.08	1.74	—	1.74	1.60	—	1.60	—	8,441	8,441	0.34	0.07	—	8,470
Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.99	4.19	38.7	35.8	0.08	1.74	—	1.74	1.60	—	1.60	—	8,441	8,441	0.34	0.07	—	8,470

Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.92	0.77	7.12	6.59	0.01	0.32	—	0.32	0.29	—	0.29	—	1,553	1,553	0.06	0.01	—	1,558
Dust From Material Movement	—	—	—	—	—	—	0.54	0.54	—	0.19	0.19	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.30	1.20	< 0.005	0.06	—	0.06	0.05	—	0.05	—	257	257	0.01	< 0.005	—	258
Dust From Material Movement	—	—	—	—	—	—	0.10	0.10	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.11	1.93	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	352	352	0.01	0.01	1.29	358
Vendor	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	88.1	88.1	< 0.005	0.01	0.25	92.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.12	0.11	0.12	1.46	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	324	324	0.02	0.01	0.03	328
Vendor	< 0.005	< 0.005	0.10	0.03	< 0.005	< 0.005	0.02	0.03	< 0.005	0.01	0.01	—	88.2	88.2	< 0.005	0.01	0.01	92.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.28	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	60.3	60.3	< 0.005	< 0.005	0.10	61.2
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	16.2	16.2	< 0.005	< 0.005	0.02	17.0
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.99	9.99	< 0.005	< 0.005	0.02	10.1
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	2.68	2.68	< 0.005	< 0.005	< 0.005	2.81
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.45	1.21	11.3	14.1	0.03	0.47	—	0.47	0.43	—	0.43	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.45	1.21	11.3	14.1	0.03	0.47	—	0.47	0.43	—	0.43	—	2,630	2,630	0.11	0.02	—	2,639

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.86	0.72	6.73	8.42	0.02	0.28	—	0.28	0.26	—	0.26	—	1,565	1,565	0.06	0.01	—	1,570
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.16	0.13	1.23	1.54	< 0.005	0.05	—	0.05	0.05	—	0.05	—	259	259	0.01	< 0.005	—	260
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.23	0.19	0.19	3.36	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	614	614	0.03	0.02	2.26	623
Vendor	0.01	0.01	0.30	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	273	273	0.01	0.04	0.77	286
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.18	0.21	2.54	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	564	564	0.03	0.02	0.06	572
Vendor	0.01	0.01	0.31	0.10	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	273	273	0.01	0.04	0.02	285
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.14	1.60	0.00	0.00	0.34	0.34	0.00	0.08	0.08	—	340	340	0.02	0.01	0.58	345
Vendor	0.01	< 0.005	0.19	0.06	< 0.005	< 0.005	0.05	0.05	< 0.005	0.01	0.01	—	162	162	< 0.005	0.02	0.20	170
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.02	0.02	0.02	0.29	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	56.3	56.3	< 0.005	< 0.005	0.10	57.1
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	26.9	26.9	< 0.005	< 0.005	0.03	28.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.38	1.16	10.7	14.1	0.03	0.41	—	0.41	0.38	—	0.38	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.38	1.16	10.7	14.1	0.03	0.41	—	0.41	0.38	—	0.38	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	0.83	7.62	10.0	0.02	0.29	—	0.29	0.27	—	0.27	—	1,878	1,878	0.08	0.02	—	1,885
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.39	1.83	< 0.005	0.05	—	0.05	0.05	—	0.05	—	311	311	0.01	< 0.005	—	312

Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.21	0.18	0.17	3.13	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	601	601	0.03	0.02	2.03	610
Vendor	0.01	0.01	0.29	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	268	268	0.01	0.04	0.73	281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.20	0.17	0.19	2.37	0.00	0.00	0.57	0.57	0.00	0.13	0.13	—	552	552	0.01	0.02	0.05	559
Vendor	0.01	0.01	0.30	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	268	268	0.01	0.04	0.02	281
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.14	0.12	0.15	1.77	0.00	0.00	0.40	0.40	0.00	0.09	0.09	—	400	400	0.01	0.02	0.63	405
Vendor	0.01	< 0.005	0.21	0.06	< 0.005	< 0.005	0.05	0.06	< 0.005	0.01	0.02	—	192	192	< 0.005	0.03	0.23	201
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.02	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	66.2	66.2	< 0.005	< 0.005	0.10	67.0
Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	31.7	31.7	< 0.005	< 0.005	0.04	33.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.29	0.24	2.25	3.01	< 0.005	0.11	—	0.11	0.10	—	0.10	—	456	456	0.02	< 0.005	—	457
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.41	0.55	< 0.005	0.02	—	0.02	0.02	—	0.02	—	75.4	75.4	< 0.005	< 0.005	—	75.7
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.08	0.07	0.07	1.16	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	211	211	0.01	0.01	0.78	215
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.07	0.88	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	194	194	0.01	0.01	0.02	197
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.28	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	59.3	59.3	< 0.005	< 0.005	0.10	60.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.82	9.82	< 0.005	< 0.005	0.02	9.96
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179

Architectural Coatings	—	19.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	19.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.35	0.46	< 0.005	0.01	—	0.01	0.01	—	0.01	—	53.7	53.7	< 0.005	< 0.005	—	53.8
Architectural Coatings	—	5.77	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.06	0.08	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	8.88	8.88	< 0.005	< 0.005	—	8.91
Architectural Coatings	—	1.05	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.04	0.67	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	123	123	0.01	< 0.005	0.45	125
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.04	0.04	0.51	0.00	0.00	0.11	0.11	0.00	0.03	0.03	—	113	113	0.01	< 0.005	0.01	114
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.16	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	34.5	34.5	< 0.005	< 0.005	0.06	34.9
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	5.70	5.70	< 0.005	< 0.005	0.01	5.78
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	6/3/2024	7/31/2024	5.00	43.0	100
Site Preparation	Site Preparation	8/1/2024	8/31/2024	5.00	22.0	60
Grading	Grading	9/2/2024	4/4/2025	5.00	155	155
Building Construction	Building Construction	3/3/2025	12/31/2026	5.00	479	1550
Paving	Paving	5/1/2025	10/1/2025	5.00	110	110
Architectural Coating	Architectural Coating	6/2/2025	10/31/2025	5.00	110	110

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38

Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Grading	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Grading	Scrapers	Diesel	Average	1.00	8.00	300	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	0.80	10.2	HHDT,MHDT
Demolition	Hauling	0.51	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2

Site Preparation	Vendor	0.41	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	25.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	2.88	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	43.6	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	8.91	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	8.71	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	477,799	159,266	0.00	0.00	135,437

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	1,852	—
Site Preparation	—	—	77.0	0.00	—
Grading	—	—	775	0.00	—
Paving	0.00	0.00	0.00	0.00	53.2

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.33	0%
Other Non-Asphalt Surfaces	51.8	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit

Temperature and Extreme Heat	26.3	annual days of extreme heat
Extreme Precipitation	1.90	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	3.03	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	95.3
AQ-PM	73.8
AQ-DPM	17.7
Drinking Water	76.3
Lead Risk Housing	11.3

Pesticides	44.7
Toxic Releases	58.2
Traffic	64.6
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	31.4
Impaired Water Bodies	12.5
Solid Waste	52.9
Sensitive Population	—
Asthma	14.7
Cardio-vascular	38.7
Low Birth Weights	72.3
Socioeconomic Factor Indicators	—
Education	29.3
Housing	10.5
Linguistic	10.4
Poverty	19.1
Unemployment	35.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	84.53740536
Employed	83.80597973
Median HI	94.66187604

Education	—
Bachelor's or higher	68.75401001
High school enrollment	25.49724111
Preschool enrollment	85.15334274
Transportation	—
Auto Access	81.29090209
Active commuting	10.04747851
Social	—
2-parent households	97.03580136
Voting	56.70473502
Neighborhood	—
Alcohol availability	86.03875273
Park access	4.69652252
Retail density	27.22956499
Supermarket access	18.68343385
Tree canopy	35.58321571
Housing	—
Homeownership	94.82869242
Housing habitability	83.8829719
Low-inc homeowner severe housing cost burden	82.90773771
Low-inc renter severe housing cost burden	29.07737713
Uncrowded housing	76.50455537
Health Outcomes	—
Insured adults	84.88387014
Arthritis	75.7
Asthma ER Admissions	80.7
High Blood Pressure	62.1

Cancer (excluding skin)	52.2
Asthma	69.3
Coronary Heart Disease	88.8
Chronic Obstructive Pulmonary Disease	86.1
Diagnosed Diabetes	84.4
Life Expectancy at Birth	87.3
Cognitively Disabled	96.3
Physically Disabled	85.5
Heart Attack ER Admissions	64.8
Mental Health Not Good	73.6
Chronic Kidney Disease	90.3
Obesity	57.4
Pedestrian Injuries	83.8
Physical Health Not Good	83.3
Stroke	88.3
Health Risk Behaviors	—
Binge Drinking	17.1
Current Smoker	66.4
No Leisure Time for Physical Activity	71.3
Climate Change Exposures	—
Wildfire Risk	13.6
SLR Inundation Area	0.0
Children	64.0
Elderly	55.7
English Speaking	67.2
Foreign-born	35.5
Outdoor Workers	39.2

Climate Change Adaptive Capacity	—
Impervious Surface Cover	87.6
Traffic Density	36.0
Traffic Access	46.9
Other Indices	—
Hardship	16.0
Other Decision Support	—
2016 Voting	67.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	31.0
Healthy Places Index Score for Project Location (b)	85.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Taken from site plan.
Construction: Construction Phases	Taken from client provided data.
Construction: Off-Road Equipment	T/L/B replaced with Crawler Tractor to accurately calculate disturbance for Site Preparation and Grading phases. Standard 8 hours work days.
Construction: Trips and VMT	Vendor Trips adjusted based on CalEEMod defaults for Building Construction and number of days for Demolition, Site Preparation, Grading, and Building Construction

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APPENDIX 4.2:

CALEEMOD CONSTRUCTION PHASE 2 EMISSIONS MODEL OUTPUTS

14577 - Arroyo Vista Phase 2 Construction (Crushing/Blasting) Detailed Report

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8. User Changes to Default Data

1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	14577 - Arroyo Vista Phase 2 Construction (Crushing/Blasting)
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	10.0
Location	33.893172, -117.351107
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5476
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	112	Dwelling Unit	42.4	218,400	1,311,840	—	362	—
Other Non-Asphalt Surfaces	1.26	Acre	1.26	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.12	27.6	38.9	37.8	0.08	1.74	3.28	5.02	1.60	1.09	2.69	—	8,828	8,828	0.36	0.11	4.14	8,864
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	5.11	26.7	38.9	37.3	0.08	1.93	5.89	7.82	1.78	2.74	4.52	—	8,800	8,800	0.36	0.09	0.09	8,834
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	2.08	5.54	15.6	16.7	0.03	0.69	1.20	1.89	0.63	0.42	1.06	—	3,471	3,471	0.14	0.06	0.81	3,489
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	0.38	1.01	2.84	3.05	0.01	0.13	0.22	0.34	0.12	0.08	0.19	—	575	575	0.02	0.01	0.13	578

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

2025	5.12	27.6	38.9	37.8	0.08	1.74	3.28	5.02	1.60	1.09	2.69	—	8,828	8,828	0.36	0.11	4.14	8,864
2026	1.58	1.33	11.1	17.1	0.03	0.41	0.61	1.02	0.38	0.15	0.53	—	3,463	3,463	0.14	0.08	2.64	3,494
2027	1.52	1.28	10.6	16.8	0.03	0.37	0.61	0.97	0.34	0.15	0.48	—	3,448	3,448	0.12	0.08	2.39	3,478
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	3.20	2.69	25.0	22.7	0.03	1.06	0.20	1.26	0.98	0.05	1.02	—	3,645	3,645	0.15	0.04	0.02	3,660
2025	5.11	26.7	38.9	37.3	0.08	1.93	5.89	7.82	1.78	2.74	4.52	—	8,800	8,800	0.36	0.09	0.09	8,834
2026	1.57	1.32	11.2	16.4	0.03	0.41	0.61	1.02	0.38	0.15	0.53	—	3,419	3,419	0.12	0.08	0.07	3,447
2027	1.51	1.27	10.6	16.2	0.03	0.37	0.61	0.97	0.34	0.15	0.48	—	3,404	3,404	0.12	0.08	0.06	3,432
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.19	0.16	1.47	1.34	< 0.005	0.06	0.01	0.07	0.06	< 0.005	0.06	—	214	214	0.01	< 0.005	0.02	215
2025	2.08	5.54	15.6	16.7	0.03	0.69	1.20	1.89	0.63	0.42	1.06	—	3,471	3,471	0.14	0.05	0.55	3,489
2026	1.12	0.94	7.98	11.8	0.02	0.30	0.43	0.73	0.27	0.10	0.38	—	2,447	2,447	0.09	0.06	0.81	2,468
2027	1.08	0.91	7.60	11.6	0.02	0.26	0.43	0.69	0.24	0.10	0.35	—	2,436	2,436	0.09	0.06	0.74	2,456
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2024	0.03	0.03	0.27	0.24	< 0.005	0.01	< 0.005	0.01	0.01	< 0.005	0.01	—	35.5	35.5	< 0.005	< 0.005	< 0.005	35.6
2025	0.38	1.01	2.84	3.05	0.01	0.13	0.22	0.34	0.12	0.08	0.19	—	575	575	0.02	0.01	0.09	578
2026	0.20	0.17	1.46	2.15	< 0.005	0.05	0.08	0.13	0.05	0.02	0.07	—	405	405	0.01	0.01	0.13	409
2027	0.20	0.17	1.39	2.12	< 0.005	0.05	0.08	0.13	0.04	0.02	0.06	—	403	403	0.01	0.01	0.12	407

3. Construction Emissions Details

3.1. Demolition (2024) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.12	2.62	24.9	21.7	0.03	1.06	—	1.06	0.98	—	0.98	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.46	1.28	< 0.005	0.06	—	0.06	0.06	—	0.06	—	201	201	0.01	< 0.005	—	202
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.27	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	33.3	33.3	< 0.005	< 0.005	—	33.4
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.08	0.07	0.09	0.95	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	198	198	0.01	0.01	0.02	201
Vendor	< 0.005	< 0.005	0.03	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	21.1	21.1	< 0.005	< 0.005	< 0.005	22.1
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.8	11.8	< 0.005	< 0.005	0.02	12.0
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.24	1.24	< 0.005	< 0.005	< 0.005	1.30
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.95	1.95	< 0.005	< 0.005	< 0.005	1.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.21	0.21	< 0.005	< 0.005	< 0.005	0.21
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.3. Demolition (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	2.86	2.40	22.2	19.9	0.03	0.92	—	0.92	0.84	—	0.84	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.15	1.35	1.21	< 0.005	0.06	—	0.06	0.05	—	0.05	—	208	208	0.01	< 0.005	—	208
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.25	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.4	34.4	< 0.005	< 0.005	—	34.5
Demolition	—	—	—	—	—	—	0.00	0.00	—	0.00	0.00	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.07	0.88	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	194	194	0.01	0.01	0.02	197
Vendor	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	20.8	20.8	< 0.005	< 0.005	< 0.005	21.8
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.9	11.9	< 0.005	< 0.005	0.02	12.1
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.26	1.26	< 0.005	< 0.005	< 0.005	1.32
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.98	1.98	< 0.005	< 0.005	< 0.005	2.00

Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.21	0.21	< 0.005	< 0.005	< 0.005	0.22
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Site Preparation (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.82	4.05	37.5	32.4	0.05	1.93	—	1.93	1.78	—	1.78	—	5,528	5,528	0.22	0.04	—	5,547
Dust From Material Movement	—	—	—	—	—	—	5.66	5.66	—	2.69	2.69	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.26	0.22	2.05	1.78	< 0.005	0.11	—	0.11	0.10	—	0.10	—	303	303	0.01	< 0.005	—	304
Dust From Material Movement	—	—	—	—	—	—	0.31	0.31	—	0.15	0.15	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.05	0.04	0.37	0.32	< 0.005	0.02	—	0.02	0.02	—	0.02	—	50.2	50.2	< 0.005	< 0.005	—	50.3
Dust From Material Movement	—	—	—	—	—	—	0.06	0.06	—	0.03	0.03	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.08	1.02	0.00	0.00	0.23	0.23	0.00	0.05	0.05	—	227	227	0.01	0.01	0.02	230
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.18	9.18	< 0.005	< 0.005	< 0.005	9.61
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	0.01	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.6	12.6	< 0.005	< 0.005	0.02	12.8
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.50	0.50	< 0.005	< 0.005	< 0.005	0.53
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.08	2.08	< 0.005	< 0.005	< 0.005	2.11
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.08	0.08	< 0.005	< 0.005	< 0.005	0.09
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.99	4.19	38.7	35.8	0.08	1.74	—	1.74	1.60	—	1.60	—	8,441	8,441	0.34	0.07	—	8,470
Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	4.99	4.19	38.7	35.8	0.08	1.74	—	1.74	1.60	—	1.60	—	8,441	8,441	0.34	0.07	—	8,470
Dust From Material Movement	—	—	—	—	—	—	2.94	2.94	—	1.01	1.01	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.02	0.86	7.96	7.36	0.02	0.36	—	0.36	0.33	—	0.33	—	1,734	1,734	0.07	0.01	—	1,740
Dust From Material Movement	—	—	—	—	—	—	0.61	0.61	—	0.21	0.21	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	0.19	0.16	1.45	1.34	< 0.005	0.07	—	0.07	0.06	—	0.06	—	287	287	0.01	< 0.005	—	288
Dust From Material Movement	—	—	—	—	—	—	0.11	0.11	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.11	1.93	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	352	352	0.01	0.01	1.29	358
Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	34.6	34.6	< 0.005	0.01	0.10	36.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.12	1.46	0.00	0.00	0.33	0.33	0.00	0.08	0.08	—	324	324	0.02	0.01	0.03	328
Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	34.6	34.6	< 0.005	0.01	< 0.005	36.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.03	0.32	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	67.4	67.4	< 0.005	< 0.005	0.11	68.4
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	7.11	7.11	< 0.005	< 0.005	0.01	7.44
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.3
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.18	1.18	< 0.005	< 0.005	< 0.005	1.23
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Building Construction (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.45	1.21	11.3	14.1	0.03	0.47	—	0.47	0.43	—	0.43	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.45	1.21	11.3	14.1	0.03	0.47	—	0.47	0.43	—	0.43	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.35	0.29	2.70	3.38	0.01	0.11	—	0.11	0.10	—	0.10	—	628	628	0.03	0.01	—	630
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.06	0.05	0.49	0.62	< 0.005	0.02	—	0.02	0.02	—	0.02	—	104	104	< 0.005	< 0.005	—	104
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.22	0.18	0.18	3.11	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	568	568	0.02	0.02	2.09	577
Vendor	0.01	0.01	0.31	0.10	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	282	282	0.01	0.04	0.80	296
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.19	2.35	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	522	522	0.02	0.02	0.05	529
Vendor	0.01	0.01	0.32	0.10	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	282	282	0.01	0.04	0.02	295
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.05	0.04	0.05	0.59	0.00	0.00	0.13	0.13	0.00	0.03	0.03	—	126	126	0.01	< 0.005	0.22	128
Vendor	< 0.005	< 0.005	0.08	0.02	< 0.005	< 0.005	0.02	0.02	< 0.005	0.01	0.01	—	67.4	67.4	< 0.005	0.01	0.08	70.5
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.11	0.00	0.00	0.02	0.02	0.00	0.01	0.01	—	20.9	20.9	< 0.005	< 0.005	0.04	21.2
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.01	11.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.11. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	1.38	1.16	10.7	14.1	0.03	0.41	—	0.41	0.38	—	0.38	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.38	1.16	10.7	14.1	0.03	0.41	—	0.41	0.38	—	0.38	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.99	0.83	7.62	10.0	0.02	0.29	—	0.29	0.27	—	0.27	—	1,878	1,878	0.08	0.02	—	1,885
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.18	0.15	1.39	1.83	< 0.005	0.05	—	0.05	0.05	—	0.05	—	311	311	0.01	< 0.005	—	312
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.19	0.17	0.16	2.90	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	556	556	0.02	0.02	1.88	564
Vendor	0.01	0.01	0.30	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	278	278	0.01	0.04	0.76	291
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.16	0.18	2.20	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	511	511	0.01	0.02	0.05	518

Vendor	0.01	0.01	0.31	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	278	278	0.01	0.04	0.02	291
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.13	0.11	0.14	1.64	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	370	370	0.01	0.01	0.58	375
Vendor	0.01	< 0.005	0.22	0.07	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	198	198	< 0.005	0.03	0.23	208
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.03	0.30	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	61.2	61.2	< 0.005	< 0.005	0.10	62.1
Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	32.8	32.8	< 0.005	0.01	0.04	34.4
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.13. Building Construction (2027) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.33	1.11	10.2	14.0	0.03	0.36	—	0.36	0.34	—	0.34	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.33	1.11	10.2	14.0	0.03	0.36	—	0.36	0.34	—	0.34	—	2,630	2,630	0.11	0.02	—	2,639
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.79	7.27	10.0	0.02	0.26	—	0.26	0.24	—	0.24	—	1,878	1,878	0.08	0.02	—	1,885
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.33	1.83	< 0.005	0.05	—	0.05	0.04	—	0.04	—	311	311	0.01	< 0.005	—	312
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.18	0.16	0.14	2.68	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	546	546	0.01	0.02	1.70	553
Vendor	0.01	0.01	0.28	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	272	272	0.01	0.04	0.69	285
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.17	0.15	0.16	2.02	0.00	0.00	0.53	0.53	0.00	0.12	0.12	—	502	502	0.01	0.02	0.04	508
Vendor	0.01	0.01	0.30	0.09	< 0.005	< 0.005	0.08	0.08	< 0.005	0.02	0.03	—	273	273	0.01	0.04	0.02	285
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.12	0.11	0.12	1.52	0.00	0.00	0.37	0.37	0.00	0.09	0.09	—	363	363	0.01	0.01	0.52	368
Vendor	0.01	< 0.005	0.21	0.06	< 0.005	< 0.005	0.06	0.06	< 0.005	0.02	0.02	—	195	195	< 0.005	0.03	0.21	204
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.28	0.00	0.00	0.07	0.07	0.00	0.02	0.02	—	60.1	60.1	< 0.005	< 0.005	0.09	60.9

Vendor	< 0.005	< 0.005	0.04	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	32.2	32.2	< 0.005	< 0.005	0.04	33.7
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.15. Paving (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.95	0.80	7.45	9.98	0.01	0.35	—	0.35	0.32	—	0.32	—	1,511	1,511	0.06	0.01	—	1,517
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.14	0.12	1.12	1.50	< 0.005	0.05	—	0.05	0.05	—	0.05	—	228	228	0.01	< 0.005	—	229
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.02	0.20	0.27	< 0.005	0.01	—	0.01	0.01	—	0.01	—	37.7	37.7	< 0.005	< 0.005	—	37.8
Paving	—	0.00	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.08	0.07	0.07	1.16	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	211	211	0.01	0.01	0.78	215
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	10.7	10.7	< 0.005	< 0.005	0.03	11.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.14	0.00	0.00	0.03	0.03	0.00	0.01	0.01	—	29.7	29.7	< 0.005	< 0.005	0.05	30.1
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.61	1.61	< 0.005	< 0.005	< 0.005	1.69
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.03	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	4.91	4.91	< 0.005	< 0.005	0.01	4.98
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.27	0.27	< 0.005	< 0.005	< 0.005	0.28
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.17. Architectural Coating (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179

Architectural	—	25.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.17	1.18	1.52	< 0.005	0.04	—	0.04	0.03	—	0.03	—	178	178	0.01	< 0.005	—	179
Architectural Coatings	—	25.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.18	0.23	< 0.005	0.01	—	0.01	0.01	—	0.01	—	26.8	26.8	< 0.005	< 0.005	—	26.9
Architectural Coatings	—	3.79	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	< 0.005	0.03	0.04	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.44	4.44	< 0.005	< 0.005	—	4.46
Architectural Coatings	—	0.69	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Worker	0.04	0.04	0.04	0.62	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	114	114	< 0.005	< 0.005	0.42	115
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.79	9.79	< 0.005	< 0.005	0.03	10.3
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.04	0.03	0.04	0.47	0.00	0.00	0.11	0.11	0.00	0.02	0.02	—	104	104	< 0.005	< 0.005	0.01	106
Vendor	< 0.005	< 0.005	0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	9.80	9.80	< 0.005	< 0.005	< 0.005	10.2
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	0.01	0.01	0.07	0.00	0.00	0.02	0.02	0.00	< 0.005	< 0.005	—	15.9	15.9	< 0.005	< 0.005	0.03	16.2
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	1.48	1.48	< 0.005	< 0.005	< 0.005	1.55
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	2.64	2.64	< 0.005	< 0.005	< 0.005	2.68
Vendor	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	0.24	0.24	< 0.005	< 0.005	< 0.005	0.26
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	12/2/2024	1/31/2025	5.00	45.0	50
Site Preparation	Site Preparation	2/3/2025	2/28/2025	5.00	20.0	30
Grading	Grading	3/3/2025	6/13/2025	5.00	75.0	75
Building Construction	Building Construction	9/1/2025	12/31/2027	5.00	610	740
Paving	Paving	7/1/2025	9/15/2025	5.00	55.0	55
Architectural Coating	Architectural Coating	8/1/2025	10/16/2025	5.00	55.0	55

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Site Preparation	Rubber Tired Dozers	Diesel	Average	3.00	8.00	367	0.40
Site Preparation	Crawler Tractors	Diesel	Average	4.00	8.00	87.0	0.43
Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Crawler Tractors	Diesel	Average	2.00	8.00	87.0	0.43
Building Construction	Cranes	Diesel	Average	1.00	8.00	367	0.29

Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	8.00	84.0	0.37
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	8.00	37.0	0.48
Grading	Bore/Drill Rigs	Diesel	Average	1.00	8.00	83.0	0.50
Grading	Scrapers	Diesel	Average	1.00	8.00	300	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	0.68	10.2	HHDT,MHDT
Demolition	Hauling	0.00	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Site Preparation	—	—	—	—
Site Preparation	Worker	17.5	18.5	LDA,LDT1,LDT2
Site Preparation	Vendor	0.30	10.2	HHDT,MHDT
Site Preparation	Hauling	0.00	20.0	HHDT
Site Preparation	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	25.0	18.5	LDA,LDT1,LDT2

Grading	Vendor	1.13	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT
Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	40.3	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	9.22	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	0.35	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	8.06	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	0.32	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	442,260	147,420	0.00	0.00	3,293

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (sq. ft.)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	—	—
Site Preparation	—	—	70.0	0.00	—
Grading	—	—	300	0.00	—
Paving	0.00	0.00	0.00	0.00	2.49

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Single Family Housing	1.23	0%
Other Non-Asphalt Surfaces	1.26	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2024	0.00	532	0.03	< 0.005
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005
2027	0.00	532	0.03	< 0.005

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	26.3	annual days of extreme heat
Extreme Precipitation	1.90	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	3.03	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.
Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A

Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	95.3
AQ-PM	73.8
AQ-DPM	17.7
Drinking Water	76.3
Lead Risk Housing	11.3
Pesticides	44.7
Toxic Releases	58.2
Traffic	64.6
Effect Indicators	—

CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	31.4
Impaired Water Bodies	12.5
Solid Waste	52.9
Sensitive Population	—
Asthma	14.7
Cardio-vascular	38.7
Low Birth Weights	72.3
Socioeconomic Factor Indicators	—
Education	29.3
Housing	10.5
Linguistic	10.4
Poverty	19.1
Unemployment	35.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	84.53740536
Employed	83.80597973
Median HI	94.66187604
Education	—
Bachelor's or higher	68.75401001
High school enrollment	25.49724111
Preschool enrollment	85.15334274

Transportation	—
Auto Access	81.29090209
Active commuting	10.04747851
Social	—
2-parent households	97.03580136
Voting	56.70473502
Neighborhood	—
Alcohol availability	86.03875273
Park access	4.69652252
Retail density	27.22956499
Supermarket access	18.68343385
Tree canopy	35.58321571
Housing	—
Homeownership	94.82869242
Housing habitability	83.8829719
Low-inc homeowner severe housing cost burden	82.90773771
Low-inc renter severe housing cost burden	29.07737713
Uncrowded housing	76.50455537
Health Outcomes	—
Insured adults	84.88387014
Arthritis	75.7
Asthma ER Admissions	80.7
High Blood Pressure	62.1
Cancer (excluding skin)	52.2
Asthma	69.3
Coronary Heart Disease	88.8
Chronic Obstructive Pulmonary Disease	86.1

Diagnosed Diabetes	84.4
Life Expectancy at Birth	87.3
Cognitively Disabled	96.3
Physically Disabled	85.5
Heart Attack ER Admissions	64.8
Mental Health Not Good	73.6
Chronic Kidney Disease	90.3
Obesity	57.4
Pedestrian Injuries	83.8
Physical Health Not Good	83.3
Stroke	88.3
Health Risk Behaviors	—
Binge Drinking	17.1
Current Smoker	66.4
No Leisure Time for Physical Activity	71.3
Climate Change Exposures	—
Wildfire Risk	13.6
SLR Inundation Area	0.0
Children	64.0
Elderly	55.7
English Speaking	67.2
Foreign-born	35.5
Outdoor Workers	39.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	87.6
Traffic Density	36.0
Traffic Access	46.9

Other Indices	—
Hardship	16.0
Other Decision Support	—
2016 Voting	67.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	31.0
Healthy Places Index Score for Project Location (b)	85.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Taken from site plan
Construction: Construction Phases	Taken from client data

Construction: Off-Road Equipment	T/L/B replaced with Crawler Tractor to accurately calculate disturbance for Site Preparation and Grading phases Standard 8 hours work days
Construction: Trips and VMT	Vendor Trips adjusted based on CalEEMod defaults for Building Construction and number of days for Demolition, Site Preparation, Grading, and Building Construction.

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APPENDIX 4.3:

CALEEMOD OPERATIONAL EMISSIONS MODEL OUTPUTS

14577 - Arroyo Vista Detailed Report

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1. Basic Project Information

1.1. Basic Project Information

Data Field	Value
Project Name	14577 - Arroyo Vista
Lead Agency	—
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	10.0
Location	33.893875, -117.350246
County	Riverside-South Coast
City	Unincorporated
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	5476
EDFZ	11
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Single Family Housing	233	Dwelling Unit	88.3	454,350	0.00	—	753	—
Other Non-Asphalt Surfaces	52.5	Acre	52.5	0.00	0.00	—	—	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	11.3	21.0	13.7	90.8	0.23	0.59	6.77	7.37	0.59	1.20	1.79	133	29,130	29,263	14.6	0.95	65.8	29,977
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.55	19.3	14.1	65.5	0.22	0.59	6.77	7.36	0.58	1.20	1.78	133	27,889	28,022	14.7	0.97	4.54	28,684
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.78	19.7	11.0	74.3	0.20	0.33	6.64	6.97	0.32	1.18	1.50	133	23,619	23,752	14.6	0.96	29.6	24,432
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.78	3.59	2.00	13.6	0.04	0.06	1.21	1.27	0.06	0.22	0.27	22.1	3,910	3,932	2.41	0.16	4.89	4,045

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Mobile	9.44	8.66	7.98	75.2	0.19	0.14	6.77	6.91	0.13	1.20	1.33	—	19,898	19,898	0.75	0.86	62.9	20,237
Area	1.63	12.2	3.60	14.7	0.02	0.29	—	0.29	0.29	—	0.29	0.00	4,451	4,451	0.08	0.01	—	4,456
Energy	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	4,720	4,720	0.43	0.03	—	4,739
Water	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Waste	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Total	11.3	21.0	13.7	90.8	0.23	0.59	6.77	7.37	0.59	1.20	1.79	133	29,130	29,263	14.6	0.95	65.8	29,977
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.90	8.12	8.55	63.2	0.18	0.14	6.77	6.91	0.13	1.20	1.33	—	18,693	18,693	0.78	0.89	1.63	18,980
Area	0.41	11.1	3.48	1.48	0.02	0.28	—	0.28	0.28	—	0.28	0.00	4,415	4,415	0.08	0.01	—	4,420
Energy	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	4,720	4,720	0.43	0.03	—	4,739
Water	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Waste	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Total	9.55	19.3	14.1	65.5	0.22	0.59	6.77	7.36	0.58	1.20	1.78	133	27,889	28,022	14.7	0.97	4.54	28,684
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	8.67	7.90	8.54	64.2	0.18	0.14	6.64	6.78	0.13	1.18	1.31	—	18,512	18,512	0.77	0.88	26.6	18,821
Area	0.87	11.7	0.32	9.16	< 0.005	0.02	—	0.02	0.02	—	0.02	0.00	327	327	0.01	< 0.005	—	328
Energy	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	4,720	4,720	0.43	0.03	—	4,739
Water	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Waste	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Total	9.78	19.7	11.0	74.3	0.20	0.33	6.64	6.97	0.32	1.18	1.50	133	23,619	23,752	14.6	0.96	29.6	24,432
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.58	1.44	1.56	11.7	0.03	0.02	1.21	1.24	0.02	0.22	0.24	—	3,065	3,065	0.13	0.15	4.41	3,116
Area	0.16	2.13	0.06	1.67	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	54.1	54.1	< 0.005	< 0.005	—	54.2

Energy	0.04	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	781	781	0.07	< 0.005	—	785
Water	—	—	—	—	—	—	—	—	—	—	—	3.01	10.1	13.1	0.31	0.01	—	23.1
Waste	—	—	—	—	—	—	—	—	—	—	—	19.0	0.00	19.0	1.90	0.00	—	66.6
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Total	1.78	3.59	2.00	13.6	0.04	0.06	1.21	1.27	0.06	0.22	0.27	22.1	3,910	3,932	2.41	0.16	4.89	4,045

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	9.44	8.66	7.98	75.2	0.19	0.14	6.77	6.91	0.13	1.20	1.33	—	19,898	19,898	0.75	0.86	62.9	20,237
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	9.44	8.66	7.98	75.2	0.19	0.14	6.77	6.91	0.13	1.20	1.33	—	19,898	19,898	0.75	0.86	62.9	20,237
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	8.90	8.12	8.55	63.2	0.18	0.14	6.77	6.91	0.13	1.20	1.33	—	18,693	18,693	0.78	0.89	1.63	18,980

Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	8.90	8.12	8.55	63.2	0.18	0.14	6.77	6.91	0.13	1.20	1.33	—	18,693	18,693	0.78	0.89	1.63	18,980
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	1.58	1.44	1.56	11.7	0.03	0.02	1.21	1.24	0.02	0.22	0.24	—	3,065	3,065	0.13	0.15	4.41	3,116
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.58	1.44	1.56	11.7	0.03	0.02	1.21	1.24	0.02	0.22	0.24	—	3,065	3,065	0.13	0.15	4.41	3,116

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	2,064	2,064	0.20	0.02	—	2,076
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,064	2,064	0.20	0.02	—	2,076
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	2,064	2,064	0.20	0.02	—	2,076
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,064	2,064	0.20	0.02	—	2,076
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	342	342	0.03	< 0.005	—	344
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	—	342	342	0.03	< 0.005	—	344

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	2,656	2,656	0.24	0.01	—	2,663
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	2,656	2,656	0.24	0.01	—	2,663
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Single Family Housing	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	2,656	2,656	0.24	0.01	—	2,663
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.24	0.12	2.09	0.89	0.01	0.17	—	0.17	0.17	—	0.17	—	2,656	2,656	0.24	0.01	—	2,663
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	0.04	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	440	440	0.04	< 0.005	—	441
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	—	0.00	—	0.00	0.00	0.00	0.00	—	0.00
Total	0.04	0.02	0.38	0.16	< 0.005	0.03	—	0.03	0.03	—	0.03	—	440	440	0.04	< 0.005	—	441

4.3. Area Emissions by Source

4.3.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.41	0.20	3.48	1.48	0.02	0.28	—	0.28	0.28	—	0.28	0.00	4,415	4,415	0.08	0.01	—	4,420
Consumer Products	—	9.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipme	1.23	1.16	0.13	13.2	< 0.005	< 0.005	—	< 0.005	0.01	—	0.01	—	35.3	35.3	< 0.005	< 0.005	—	36.3
Total	1.63	12.2	3.60	14.7	0.02	0.29	—	0.29	0.29	—	0.29	0.00	4,451	4,451	0.08	0.01	—	4,456
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.41	0.20	3.48	1.48	0.02	0.28	—	0.28	0.28	—	0.28	0.00	4,415	4,415	0.08	0.01	—	4,420
Consumer Products	—	9.90	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.95	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	0.41	11.1	3.48	1.48	0.02	0.28	—	0.28	0.28	—	0.28	0.00	4,415	4,415	0.08	0.01	—	4,420
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	0.01	< 0.005	0.04	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	50.1	50.1	< 0.005	< 0.005	—	50.1
Consumer Products	—	1.81	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	—	0.17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.15	0.15	0.02	1.65	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.01	4.01	< 0.005	< 0.005	—	4.12
Total	0.16	2.13	0.06	1.67	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	54.1	54.1	< 0.005	< 0.005	—	54.2

4.4. Water Emissions by Land Use

4.4.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	18.2	61.2	79.3	1.87	0.04	—	139
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	3.01	10.1	13.1	0.31	0.01	—	23.1
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	3.01	10.1	13.1	0.31	0.01	—	23.1

4.5. Waste Emissions by Land Use

4.5.2. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	115	0.00	115	11.5	0.00	—	402
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	19.0	0.00	19.0	1.90	0.00	—	66.6
Other Non-Asphalt Surfaces	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
Total	—	—	—	—	—	—	—	—	—	—	—	19.0	0.00	19.0	1.90	0.00	—	66.6

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.91	2.91
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Single Family Housing	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.48	0.48

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10. Soil Carbon Accumulation By Vegetation Type

4.10.1. Soil Carbon Accumulation By Vegetation Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Vegetation	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.2. Above and Belowground Carbon Accumulation by Land Use Type - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.10.3. Avoided and Sequestered Emissions by Species - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Species	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Avoided	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Sequestered	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Removed	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Subtotal	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Single Family Housing	2,197	2,209	1,976	791,040	24,264	24,392	21,819	8,735,466
Other Non-Asphalt Surfaces	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Single Family Housing	—
Wood Fireplaces	0
Gas Fireplaces	210
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	23

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
920058.75	306,686	0.00	0.00	137,188

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Single Family Housing	2,176,044	346	0.0330	0.0040	8,286,485
Other Non-Asphalt Surfaces	0.00	346	0.0330	0.0040	0.00

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Single Family Housing	9,476,990	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Single Family Housing	66.0	0.00
Other Non-Asphalt Surfaces	0.00	0.00

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced

Single Family Housing	Average room A/C & Other residential A/C and heat pumps	User Defined	750	< 0.005	2.50	2.50	10.0
Single Family Housing	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type
—	—

5.18. Vegetation

5.18.1. Land Use Change

5.18.1.1. Unmitigated

Vegetation Land Use Type	Vegetation Soil Type	Initial Acres	Final Acres

5.18.1. Biomass Cover Type

5.18.1.1. Unmitigated

Biomass Cover Type	Initial Acres	Final Acres

5.18.2. Sequestration

5.18.2.1. Unmitigated

Tree Type	Number	Electricity Saved (kWh/year)	Natural Gas Saved (btu/year)

6. Climate Risk Detailed Report

6.1. Climate Risk Summary

Cal-Adapt midcentury 2040–2059 average projections for four hazards are reported below for your project location. These are under Representation Concentration Pathway (RCP) 8.5 which assumes GHG emissions will continue to rise strongly through 2050 and then plateau around 2100.

Climate Hazard	Result for Project Location	Unit
Temperature and Extreme Heat	26.3	annual days of extreme heat
Extreme Precipitation	1.90	annual days with precipitation above 20 mm
Sea Level Rise	0.00	meters of inundation depth
Wildfire	3.03	annual hectares burned

Temperature and Extreme Heat data are for grid cell in which your project are located. The projection is based on the 98th historical percentile of daily maximum/minimum temperatures from observed historical data (32 climate model ensemble from Cal-Adapt, 2040–2059 average under RCP 8.5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Extreme Precipitation data are for the grid cell in which your project are located. The threshold of 20 mm is equivalent to about ¾ an inch of rain, which would be light to moderate rainfall if received over a full day or heavy rain if received over a period of 2 to 4 hours. Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.
Sea Level Rise data are for the grid cell in which your project are located. The projections are from Radke et al. (2017), as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider different increments of sea level rise coupled with extreme storm events. Users may select from four model simulations to view the range in potential inundation depth for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 50 meters (m) by 50 m, or about 164 feet (ft) by 164 ft.

Wildfire data are for the grid cell in which your project are located. The projections are from UC Davis, as reported in Cal-Adapt (2040–2059 average under RCP 8.5), and consider historical data of climate, vegetation, population density, and large (> 400 ha) fire history. Users may select from four model simulations to view the range in potential wildfire probabilities for the grid cell. The four simulations make different assumptions about expected rainfall and temperature are: Warmer/drier (HadGEM2-ES), Cooler/wetter (CNRM-CM5), Average conditions (CanESM2), Range of different rainfall and temperature possibilities (MIROC5). Each grid cell is 6 kilometers (km) by 6 km, or 3.7 miles (mi) by 3.7 mi.

6.2. Initial Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	0	0	N/A
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	0	0	N/A
Wildfire	1	0	0	N/A
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A
Air Quality Degradation	0	0	0	N/A

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores do not include implementation of climate risk reduction measures.

6.3. Adjusted Climate Risk Scores

Climate Hazard	Exposure Score	Sensitivity Score	Adaptive Capacity Score	Vulnerability Score
Temperature and Extreme Heat	3	1	1	3
Extreme Precipitation	N/A	N/A	N/A	N/A
Sea Level Rise	1	1	1	2
Wildfire	1	1	1	2
Flooding	N/A	N/A	N/A	N/A
Drought	N/A	N/A	N/A	N/A
Snowpack Reduction	N/A	N/A	N/A	N/A

Air Quality Degradation	1	1	1	2

The sensitivity score reflects the extent to which a project would be adversely affected by exposure to a climate hazard. Exposure is rated on a scale of 1 to 5, with a score of 5 representing the greatest exposure.
The adaptive capacity of a project refers to its ability to manage and reduce vulnerabilities from projected climate hazards. Adaptive capacity is rated on a scale of 1 to 5, with a score of 5 representing the greatest ability to adapt.
The overall vulnerability scores are calculated based on the potential impacts and adaptive capacity assessments for each hazard. Scores include implementation of climate risk reduction measures.

6.4. Climate Risk Reduction Measures

7. Health and Equity Details

7.1. CalEnviroScreen 4.0 Scores

The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Exposure Indicators	—
AQ-Ozone	95.3
AQ-PM	73.8
AQ-DPM	17.7
Drinking Water	76.3
Lead Risk Housing	11.3
Pesticides	44.7
Toxic Releases	58.2
Traffic	64.6
Effect Indicators	—
CleanUp Sites	0.00
Groundwater	0.00
Haz Waste Facilities/Generators	31.4
Impaired Water Bodies	12.5
Solid Waste	52.9

Sensitive Population	—
Asthma	14.7
Cardio-vascular	38.7
Low Birth Weights	72.3
Socioeconomic Factor Indicators	—
Education	29.3
Housing	10.5
Linguistic	10.4
Poverty	19.1
Unemployment	35.0

7.2. Healthy Places Index Scores

The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

Indicator	Result for Project Census Tract
Economic	—
Above Poverty	84.53740536
Employed	83.80597973
Median HI	94.66187604
Education	—
Bachelor's or higher	68.75401001
High school enrollment	25.49724111
Preschool enrollment	85.15334274
Transportation	—
Auto Access	81.29090209
Active commuting	10.04747851
Social	—
2-parent households	97.03580136

Voting	56.70473502
Neighborhood	—
Alcohol availability	86.03875273
Park access	4.69652252
Retail density	27.22956499
Supermarket access	18.68343385
Tree canopy	35.58321571
Housing	—
Homeownership	94.82869242
Housing habitability	83.8829719
Low-inc homeowner severe housing cost burden	82.90773771
Low-inc renter severe housing cost burden	29.07737713
Uncrowded housing	76.50455537
Health Outcomes	—
Insured adults	84.88387014
Arthritis	75.7
Asthma ER Admissions	80.7
High Blood Pressure	62.1
Cancer (excluding skin)	52.2
Asthma	69.3
Coronary Heart Disease	88.8
Chronic Obstructive Pulmonary Disease	86.1
Diagnosed Diabetes	84.4
Life Expectancy at Birth	87.3
Cognitively Disabled	96.3
Physically Disabled	85.5
Heart Attack ER Admissions	64.8

Mental Health Not Good	73.6
Chronic Kidney Disease	90.3
Obesity	57.4
Pedestrian Injuries	83.8
Physical Health Not Good	83.3
Stroke	88.3
Health Risk Behaviors	—
Binge Drinking	17.1
Current Smoker	66.4
No Leisure Time for Physical Activity	71.3
Climate Change Exposures	—
Wildfire Risk	13.6
SLR Inundation Area	0.0
Children	64.0
Elderly	55.7
English Speaking	67.2
Foreign-born	35.5
Outdoor Workers	39.2
Climate Change Adaptive Capacity	—
Impervious Surface Cover	87.6
Traffic Density	36.0
Traffic Access	46.9
Other Indices	—
Hardship	16.0
Other Decision Support	—
2016 Voting	67.3

7.3. Overall Health & Equity Scores

Metric	Result for Project Census Tract
CalEnviroScreen 4.0 Score for Project Location (a)	31.0
Healthy Places Index Score for Project Location (b)	85.0
Project Located in a Designated Disadvantaged Community (Senate Bill 535)	No
Project Located in a Low-Income Community (Assembly Bill 1550)	No
Project Located in a Community Air Protection Program Community (Assembly Bill 617)	No

a: The maximum CalEnviroScreen score is 100. A high score (i.e., greater than 50) reflects a higher pollution burden compared to other census tracts in the state.
b: The maximum Health Places Index score is 100. A high score (i.e., greater than 50) reflects healthier community conditions compared to other census tracts in the state.

7.4. Health & Equity Measures

No Health & Equity Measures selected.

7.5. Evaluation Scorecard

Health & Equity Evaluation Scorecard not completed.

7.6. Health & Equity Custom Measures

No Health & Equity Custom Measures created.

8. User Changes to Default Data

Screen	Justification
Land Use	Taken from site plan.
Operations: Vehicle Data	Trip characteristics based on information provided in the Traffic Analysis.
Operations: Hearths	SCAQMD Rule 445 no wood burning devices. Wood burning devices added tp gas devices.
Operations: Refrigerants	Beginning 1 January 2025, all new air conditioning equipment may not use refrigerants with a GWP of 750 or greater.
Operations: Architectural Coatings	SCAQMD Rule 113

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APPENDIX 4.4:

EMFAC2021

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2024
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Fuel_Consumption	Fuel_Consumption	Total Fuel	VMT	Total VMT	Miles per Gallon	Vehicle Class
Riverside (SC)	2024	HHDT	Aggregate	Aggregate	Gasoline	7.589475903	347.9694468	0.092180823	92.18082291	321404.9638	347.9694468	1967302.751	6.12	HHDT
Riverside (SC)	2024	HHDT	Aggregate	Aggregate	Diesel	14792.02338	1911347.779	313.0439759	313043.9759		1911347.779			
Riverside (SC)	2024	HHDT	Aggregate	Aggregate	Electricity	47.99547895	5148.201829	0	0		5148.201829			
Riverside (SC)	2024	HHDT	Aggregate	Aggregate	Natural Gas	740.0705237	50458.80082	8.268807048	8268.807048		50458.80082			
Riverside (SC)	2024	LDA	Aggregate	Aggregate	Gasoline	469145.3818	20418129.53	688.4836596	688483.6596	700469.6115	20418129.53	22069128.65	31.51	LDA
Riverside (SC)	2024	LDA	Aggregate	Aggregate	Diesel	1473.049219	54327.45303	1.267188759	1267.188759		54327.45303			
Riverside (SC)	2024	LDA	Aggregate	Aggregate	Electricity	19934.69439	945704.6798	0	0		945704.6798			
Riverside (SC)	2024	LDA	Aggregate	Aggregate	Plug-in Hybrid	12893.65575	650966.9876	10.71876311	10718.76311		650966.9876			
Riverside (SC)	2024	LDT1	Aggregate	Aggregate	Gasoline	40643.24621	1523061.246	62.04624692	62046.24692	62104.32538	1523061.246	1529163.988	24.62	LDT1
Riverside (SC)	2024	LDT1	Aggregate	Aggregate	Diesel	18.16927182	339.6979643	0.013831102	13.83110227		339.6979643			
Riverside (SC)	2024	LDT1	Aggregate	Aggregate	Electricity	60.98632141	2789.967089	0	0		2789.967089			
Riverside (SC)	2024	LDT1	Aggregate	Aggregate	Plug-in Hybrid	52.35545177	2973.077776	0.044247357	44.24735695		2973.077776			
Riverside (SC)	2024	LDT2	Aggregate	Aggregate	Gasoline	196761.1569	8732860.794	359.674683	359674.683	361927.3798	8732860.794	8893408.735	24.57	LDT2
Riverside (SC)	2024	LDT2	Aggregate	Aggregate	Diesel	611.2140627	29007.74721	0.880423066	880.4230662		29007.74721			
Riverside (SC)	2024	LDT2	Aggregate	Aggregate	Electricity	1212.721837	43455.52608	0	0		43455.52608			
Riverside (SC)	2024	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1617.209463	88084.6679	1.372273758	1372.273758		88084.6679			
Riverside (SC)	2024	LHDT1	Aggregate	Aggregate	Gasoline	17828.73734	656766.0119	48.36247552	48362.47552	75554.20605	656766.0119	1221087.42	16.16	LHDT1
Riverside (SC)	2024	LHDT1	Aggregate	Aggregate	Diesel	15247.60565	560367.9206	27.19173053	27191.73053		560367.9206			
Riverside (SC)	2024	LHDT1	Aggregate	Aggregate	Electricity	53.50587181	3953.487241	0	0		3953.487241			
Riverside (SC)	2024	LHDT2	Aggregate	Aggregate	Gasoline	2494.679179	89754.81853	7.38743171	7387.43171	22224.411	89754.81853	344827.7113	15.52	LHDT2
Riverside (SC)	2024	LHDT2	Aggregate	Aggregate	Diesel	6844.928194	254103.3578	14.83697929	14836.97929		254103.3578			
Riverside (SC)	2024	LHDT2	Aggregate	Aggregate	Electricity	13.8489928	969.5349487	0	0		969.5349487			
Riverside (SC)	2024	MCY	Aggregate	Aggregate	Gasoline	24077.0623	140258.0803	3.359217865	3359.217865	3359.217865	140258.0803	140258.0803	41.75	MCY
Riverside (SC)	2024	MDV	Aggregate	Aggregate	Gasoline	158529.7591	6468418.76	332.0736912	332073.6912	337278.1883	6468418.76	6673535.232	19.79	MDV
Riverside (SC)	2024	MDV	Aggregate	Aggregate	Diesel	2456.219583	102039.6434	4.306633032	4306.633032		102039.6434			
Riverside (SC)	2024	MDV	Aggregate	Aggregate	Electricity	1347.135818	48185.7285	0	0		48185.7285			
Riverside (SC)	2024	MDV	Aggregate	Aggregate	Plug-in Hybrid	1094.492843	54891.09982	0.897864131	897.864131		54891.09982			
Riverside (SC)	2024	MH	Aggregate	Aggregate	Gasoline	4781.777946	41623.53594	8.518926412	8518.926412	10212.97469	41623.53594	59176.14669	5.79	MH
Riverside (SC)	2024	MH	Aggregate	Aggregate	Diesel	2046.063726	17552.61075	1.694048275	1694.048275		17552.61075			
Riverside (SC)	2024	MHDT	Aggregate	Aggregate	Gasoline	1238.0029	49965.95549	9.588666638	9588.666638	73502.73221	49965.95549	624307.4842	8.49	MHDT
Riverside (SC)	2024	MHDT	Aggregate	Aggregate	Diesel	12954.3675	564761.4751	63.06414519	63064.14519		564761.4751			
Riverside (SC)	2024	MHDT	Aggregate	Aggregate	Electricity	40.46425607	2074.722372	0	0		2074.722372			
Riverside (SC)	2024	MHDT	Aggregate	Aggregate	Natural Gas	158.0466253	7505.331205	0.849920382	849.9203818		7505.331205			
Riverside (SC)	2024	OBUS	Aggregate	Aggregate	Gasoline	374.6153087	12781.812	2.496601383	2496.601383	4662.380277	12781.812	30088.9967	6.45	OBUS
Riverside (SC)	2024	OBUS	Aggregate	Aggregate	Diesel	219.2789175	15140.91273	1.951181612	1951.181612		15140.91273			
Riverside (SC)	2024	OBUS	Aggregate	Aggregate	Electricity	0.821516166	55.60331633	0	0		55.60331633			
Riverside (SC)	2024	OBUS	Aggregate	Aggregate	Natural Gas	34.6553722	2110.668656	0.214597282	214.5972817		2110.668656			
Riverside (SC)	2024	SBUS	Aggregate	Aggregate	Gasoline	423.5817437	16753.46749	1.914821769	1914.821769	5918.221943	16753.46749	37909.3201	6.41	SBUS
Riverside (SC)	2024	SBUS	Aggregate	Aggregate	Diesel	491.8063992	10225.99182	1.394925642	1394.925642		10225.99182			
Riverside (SC)	2024	SBUS	Aggregate	Aggregate	Electricity	2.445505521	61.99924762	0	0		61.99924762			
Riverside (SC)	2024	SBUS	Aggregate	Aggregate	Natural Gas	443.1589434	10867.86154	2.608474532	2608.474532		10867.86154			
Riverside (SC)	2024	UBUS	Aggregate	Aggregate	Gasoline	146.2127201	18511.1132	3.282633075	3282.633075	11054.35384	18511.1132	49631.8201	4.49	UBUS
Riverside (SC)	2024	UBUS	Aggregate	Aggregate	Diesel	0.3117338	30.10971099	0.002675115	2.675115035		30.10971099			
Riverside (SC)	2024	UBUS	Aggregate	Aggregate	Electricity	0.120004951	18.36371585	0	0		18.36371585			
Riverside (SC)	2024	UBUS	Aggregate	Aggregate	Natural Gas	252.109466	31072.23347	7.769045647	7769.045647		31072.23347			

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2025
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	endar Y	hicle Categc	Model Year	Speed	Fuel	Population	Total VMT	Fuel Consumption	Fuel_Consumption	Total Fuel	VMT	Total VMT	Miles per Gallon	Vehicle Class
Riverside (SC)	2025	HHDT	Aggregate	Aggregate	Gasoline	6.232252524	303.889871	0.078875502	78.87550173	324061.9332	303.889871	2014903.459	6.22	HHDT
Riverside (SC)	2025	HHDT	Aggregate	Aggregate	Diesel	15281.49903	1950611.476	315.5182536	315518.2536		1950611.476			
Riverside (SC)	2025	HHDT	Aggregate	Aggregate	Electricity	103.9487733	11894.93596	0	0		11894.93596			
Riverside (SC)	2025	HHDT	Aggregate	Aggregate	Natural Gas	781.6601067	52093.15724	8.464804133	8464.804133		52093.15724			
Riverside (SC)	2025	LDA	Aggregate	Aggregate	Gasoline	469318.5342	20373765.83	673.3165394	673316.5394	685799.5767	20373765.83	22281991.59	32.49	LDA
Riverside (SC)	2025	LDA	Aggregate	Aggregate	Diesel	1383.809245	49996.02059	1.157204906	1157.204906		49996.02059			
Riverside (SC)	2025	LDA	Aggregate	Aggregate	Electricity	23756.17576	1153396.904	0	0		1153396.904			
Riverside (SC)	2025	LDA	Aggregate	Aggregate	Plug-in Hybrid	14087.23202	704832.8394	11.32583244	11325.83244		704832.8394			
Riverside (SC)	2025	LDT1	Aggregate	Aggregate	Gasoline	39844.42885	1499609.575	59.92078241	59920.78241	59994.79347	1499609.575	1508277.871	25.14	LDT1
Riverside (SC)	2025	LDT1	Aggregate	Aggregate	Diesel	16.26032827	298.1728862	0.012131898	12.13189805		298.1728862			
Riverside (SC)	2025	LDT1	Aggregate	Aggregate	Electricity	84.57619148	4089.475353	0	0		4089.475353			
Riverside (SC)	2025	LDT1	Aggregate	Aggregate	Plug-in Hybrid	76.19034646	4280.647946	0.061879155	61.87915548		4280.647946			
Riverside (SC)	2025	LDT2	Aggregate	Aggregate	Gasoline	201900.7772	8973973.952	360.0165635	360016.5635	362521.4419	8973973.952	9168424.554	25.29	LDT2
Riverside (SC)	2025	LDT2	Aggregate	Aggregate	Diesel	648.0824816	30519.42791	0.906087045	906.0870448		30519.42791			
Riverside (SC)	2025	LDT2	Aggregate	Aggregate	Electricity	1658.408696	58637.73041	0	0		58637.73041			
Riverside (SC)	2025	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1963.286623	105293.4446	1.598791388	1598.791388		105293.4446			
Riverside (SC)	2025	LHDT1	Aggregate	Aggregate	Gasoline	17598.36242	652458.21	46.82732866	46827.32866	73403.79877	652458.21	1212550.7	16.52	LHDT1
Riverside (SC)	2025	LHDT1	Aggregate	Aggregate	Diesel	15075.59282	549831.8274	26.5764701	26576.4701		549831.8274			
Riverside (SC)	2025	LHDT1	Aggregate	Aggregate	Electricity	149.6982853	10260.66293	0	0		10260.66293			
Riverside (SC)	2025	LHDT2	Aggregate	Aggregate	Gasoline	2462.303572	88408.90183	7.133200743	7133.200743	21661.35468	88408.90183	341190.0394	15.75	LHDT2
Riverside (SC)	2025	LHDT2	Aggregate	Aggregate	Diesel	6820.445818	250292.8301	14.52815394	14528.15394		250292.8301			
Riverside (SC)	2025	LHDT2	Aggregate	Aggregate	Electricity	38.18158868	2488.307475	0	0		2488.307475			
Riverside (SC)	2025	MCY	Aggregate	Aggregate	Gasoline	24005.46384	138549.7935	3.307549619	3307.549619	3307.549619	138549.7935	138549.7935	41.89	MCY
Riverside (SC)	2025	MDV	Aggregate	Aggregate	Gasoline	157992.5704	6448292.677	323.4938203	323493.8203	328676.5122	6448292.677	6678432.543	20.32	MDV
Riverside (SC)	2025	MDV	Aggregate	Aggregate	Diesel	2427.253752	99526.12558	4.137752355	4137.752355		99526.12558			
Riverside (SC)	2025	MDV	Aggregate	Aggregate	Electricity	1830.142844	64565.5975	0	0		64565.5975			
Riverside (SC)	2025	MDV	Aggregate	Aggregate	Plug-in Hybrid	1324.504282	66048.14278	1.044939643	1044.939643		66048.14278			
Riverside (SC)	2025	MH	Aggregate	Aggregate	Gasoline	4508.467531	38795.29207	7.939175542	7939.175542	9582.26868	38795.29207	55815.16631	5.82	MH
Riverside (SC)	2025	MH	Aggregate	Aggregate	Diesel	2015.081247	17019.87424	1.643093138	1643.093138		17019.87424			
Riverside (SC)	2025	MHDT	Aggregate	Aggregate	Gasoline	1219.56756	49718.98291	9.418016992	9418.016992	73843.62953	49718.98291	635118.1523	8.60	MHDT
Riverside (SC)	2025	MHDT	Aggregate	Aggregate	Diesel	13275.74248	571359.1019	63.53271272	63532.71272		571359.1019			
Riverside (SC)	2025	MHDT	Aggregate	Aggregate	Electricity	118.7135177	6143.919124	0	0		6143.919124			
Riverside (SC)	2025	MHDT	Aggregate	Aggregate	Natural Gas	169.7860028	7896.148358	0.892899818	892.8998181		7896.148358			
Riverside (SC)	2025	OBUS	Aggregate	Aggregate	Gasoline	362.5102847	12151.28279	2.347950658	2347.950658	4510.758842	12151.28279	29688.04546	6.58	OBUS
Riverside (SC)	2025	OBUS	Aggregate	Aggregate	Diesel	224.9321911	15183.67961	1.940769719	1940.769719		15183.67961			
Riverside (SC)	2025	OBUS	Aggregate	Aggregate	Electricity	2.021694394	134.2617193	0	0		134.2617193			
Riverside (SC)	2025	OBUS	Aggregate	Aggregate	Natural Gas	36.9521167	2218.821339	0.222038465	222.0384652		2218.821339			
Riverside (SC)	2025	SBUS	Aggregate	Aggregate	Gasoline	426.2067312	16859.59503	1.92304347	1923.04347	5926.536182	16859.59503	38036.5897	6.42	SBUS
Riverside (SC)	2025	SBUS	Aggregate	Aggregate	Diesel	483.8964136	9931.139032	1.352394432	1352.394432		9931.139032			
Riverside (SC)	2025	SBUS	Aggregate	Aggregate	Electricity	5.22909553	143.1587763	0	0		143.1587763			
Riverside (SC)	2025	SBUS	Aggregate	Aggregate	Natural Gas	457.8096259	11102.69686	2.65109828	2651.09828		11102.69686			
Riverside (SC)	2025	UBUS	Aggregate	Aggregate	Gasoline	146.4959788	18545.85863	3.288543187	3288.543187	10964.44655	18545.85863	49731.99827	4.54	UBUS
Riverside (SC)	2025	UBUS	Aggregate	Aggregate	Diesel	0.3117338	30.10971099	0.002675115	2.675115035		30.10971099			
Riverside (SC)	2025	UBUS	Aggregate	Aggregate	Electricity	0.20926462	33.75780976	0	0		33.75780976			
Riverside (SC)	2025	UBUS	Aggregate	Aggregate	Natural Gas	252.5418031	31122.27213	7.673228246	7673.228246		31122.27213			

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2026
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	endar Y	hicle Categc	Model Year	Speed	Fuel	Population	Total VMT	Fuel Consumption	Fuel_Consumption	Total Fuel	VMT	Total VMT	Miles per Gallon	Vehicle Class
Riverside (SC)	2026	HHDT	Aggregate	Aggregate	Gasoline	5.301713201	269.8155783	0.068469804	68.46980429	326183.3321	269.8155783	2063431.007	6.33	HHDT
Riverside (SC)	2026	HHDT	Aggregate	Aggregate	Diesel	15687.78827	1988453.103	317.4311809	317431.1809		1988453.103			
Riverside (SC)	2026	HHDT	Aggregate	Aggregate	Electricity	181.0556624	20854.79688	0	0		20854.79688			
Riverside (SC)	2026	HHDT	Aggregate	Aggregate	Natural Gas	822.9858358	53853.29132	8.683681391	8683.681391		53853.29132			
Riverside (SC)	2026	LDA	Aggregate	Aggregate	Gasoline	470220.2179	20338993.18	657.9019755	657901.9755	670683.7214	20338993.18	22423581.77	33.43	LDA
Riverside (SC)	2026	LDA	Aggregate	Aggregate	Diesel	1278.903087	45656.81459	1.04446634	1044.46634		45656.81459			
Riverside (SC)	2026	LDA	Aggregate	Aggregate	Electricity	27110.24505	1294343.513	0	0		1294343.513			
Riverside (SC)	2026	LDA	Aggregate	Aggregate	Plug-in Hybrid	15111.22646	744588.2646	11.73727955	11737.27955		744588.2646			
Riverside (SC)	2026	LDT1	Aggregate	Aggregate	Gasoline	39097.73904	1475770.596	57.77065353	57770.65353	57860.51954	1475770.596	1487146.031	25.70	LDT1
Riverside (SC)	2026	LDT1	Aggregate	Aggregate	Diesel	13.62192751	246.3725383	0.009960174	9.960173709		246.3725383			
Riverside (SC)	2026	LDT1	Aggregate	Aggregate	Electricity	113.2552136	5510.233656	0	0		5510.233656			
Riverside (SC)	2026	LDT1	Aggregate	Aggregate	Plug-in Hybrid	101.686721	5618.828531	0.079905828	79.90582849		5618.828531			
Riverside (SC)	2026	LDT2	Aggregate	Aggregate	Gasoline	207104.2919	9189016.153	359.2463978	359246.3978	361967.9264	9189016.153	9414279.735	26.01	LDT2
Riverside (SC)	2026	LDT2	Aggregate	Aggregate	Diesel	682.5626595	31821.71127	0.923868936	923.8689364		31821.71127			
Riverside (SC)	2026	LDT2	Aggregate	Aggregate	Electricity	2094.273367	72949.08151	0	0		72949.08151			
Riverside (SC)	2026	LDT2	Aggregate	Aggregate	Plug-in Hybrid	2291.195555	120492.7893	1.797659677	1797.659677		120492.7893			
Riverside (SC)	2026	LHDT1	Aggregate	Aggregate	Gasoline	17398.34216	648258.6134	45.43230342	45432.30342	71378.10447	648258.6134	1205852.586	16.89	LHDT1
Riverside (SC)	2026	LHDT1	Aggregate	Aggregate	Diesel	14868.32038	538771.2685	25.94580105	25945.80105		538771.2685			
Riverside (SC)	2026	LHDT1	Aggregate	Aggregate	Electricity	286.9935654	18822.70429	0	0		18822.70429			
Riverside (SC)	2026	LHDT2	Aggregate	Aggregate	Gasoline	2430.034218	87077.56554	6.894650038	6894.650038	21104.05262	87077.56554	337819.1023	16.01	LHDT2
Riverside (SC)	2026	LHDT2	Aggregate	Aggregate	Diesel	6777.719033	246178.6334	14.20940258	14209.40258		246178.6334			
Riverside (SC)	2026	LHDT2	Aggregate	Aggregate	Electricity	73.06243174	4562.903373	0	0		4562.903373			
Riverside (SC)	2026	MCY	Aggregate	Aggregate	Gasoline	23937.33086	137142.5787	3.259850983	3259.850983	3259.850983	137142.5787	137142.5787	42.07	MCY
Riverside (SC)	2026	MDV	Aggregate	Aggregate	Gasoline	157654.7501	6425602.492	314.7102388	314710.2388	319841.9429	6425602.492	6678197.896	20.88	MDV
Riverside (SC)	2026	MDV	Aggregate	Aggregate	Diesel	2395.180805	96875.32958	3.958815392	3958.815392		96875.32958			
Riverside (SC)	2026	MDV	Aggregate	Aggregate	Electricity	2298.450518	79855.22944	0	0		79855.22944			
Riverside (SC)	2026	MDV	Aggregate	Aggregate	Plug-in Hybrid	1539.714974	75864.84529	1.172888712	1172.888712		75864.84529			
Riverside (SC)	2026	MH	Aggregate	Aggregate	Gasoline	4250.734566	36312.00617	7.425870006	7425.870006	9021.53348	36312.00617	52833.22222	5.86	MH
Riverside (SC)	2026	MH	Aggregate	Aggregate	Diesel	1981.725027	16521.21606	1.595663475	1595.663475		16521.21606			
Riverside (SC)	2026	MHDT	Aggregate	Aggregate	Gasoline	1204.155669	49534.83957	9.263997368	9263.997368	74067.74937	49534.83957	646239.7348	8.72	MHDT
Riverside (SC)	2026	MHDT	Aggregate	Aggregate	Diesel	13571.64646	577213.7586	63.87135704	63871.35704		577213.7586			
Riverside (SC)	2026	MHDT	Aggregate	Aggregate	Electricity	219.063018	11241.81607	0	0		11241.81607			
Riverside (SC)	2026	MHDT	Aggregate	Aggregate	Natural Gas	180.8134913	8249.320573	0.932394966	932.394966		8249.320573			
Riverside (SC)	2026	OBUS	Aggregate	Aggregate	Gasoline	350.9276772	11597.74291	2.216471452	2216.471452	4375.818964	11597.74291	29375.18585	6.71	OBUS
Riverside (SC)	2026	OBUS	Aggregate	Aggregate	Diesel	230.0918445	15233.6578	1.930307181	1930.307181		15233.6578			
Riverside (SC)	2026	OBUS	Aggregate	Aggregate	Electricity	3.398598414	222.0634986	0	0		222.0634986			
Riverside (SC)	2026	OBUS	Aggregate	Aggregate	Natural Gas	39.09901647	2321.721637	0.229040331	229.0403313		2321.721637			
Riverside (SC)	2026	SBUS	Aggregate	Aggregate	Gasoline	428.6165302	16957.83533	1.930418011	1930.418011	5931.110106	16957.83533	38160.16985	6.43	SBUS
Riverside (SC)	2026	SBUS	Aggregate	Aggregate	Diesel	474.8674611	9627.108018	1.308586985	1308.586985		9627.108018			
Riverside (SC)	2026	SBUS	Aggregate	Aggregate	Electricity	8.960082283	245.5300912	0	0		245.5300912			
Riverside (SC)	2026	SBUS	Aggregate	Aggregate	Natural Gas	472.4302591	11329.69641	2.69210511	2692.10511		11329.69641			
Riverside (SC)	2026	UBUS	Aggregate	Aggregate	Gasoline	146.7792196	18580.60009	3.25315693	3253.15693	10939.25606	18580.60009	49832.17645	4.56	UBUS
Riverside (SC)	2026	UBUS	Aggregate	Aggregate	Diesel	0.3117338	30.10971099	0.002675115	2.675114958		30.10971099			
Riverside (SC)	2026	UBUS	Aggregate	Aggregate	Electricity	0.298524289	49.15190367	0	0		49.15190367			
Riverside (SC)	2026	UBUS	Aggregate	Aggregate	Natural Gas	252.9741581	31172.31474	7.683424013	7683.424013		31172.31474			

Source: EMFAC2021 (v1.0.2) Emissions Inventory
Region Type: Sub-Area
Region: Riverside (SC)
Calendar Year: 2027
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, kWh/day for Energy Consumption, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population	VMT	Fuel_Consumption	Fuel_Consumption	Total Fuel	VMT	Total VMT	Miles per Gallon	Vehicle Class
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Gasoline	4.417589037	240.8696114	0.059741457	59.74145741	327553.1219	240.8696114	2112996.232	6.45	HHDT
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Diesel	16021.09962	2023648.424	318.6419902	318641.9902		2023648.424			
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Electricity	291.1277388	33695.26576	0	0		33695.26576			
Riverside (SC)	2027	HHDT	Aggregate	Aggregate	Natural Gas	859.7365707	55411.6726	8.851390205	8851.390205		55411.6726			
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Gasoline	471235.7168	20354484.89	646.3182298	646318.2298	659332.1669	20354484.89	22605957.54	34.29	LDA
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Diesel	1176.545459	41562.34596	0.941772786	941.772786		41562.34596			
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Electricity	30348.88532	1428770.722	0	0		1428770.722			
Riverside (SC)	2027	LDA	Aggregate	Aggregate	Plug-in Hybrid	16056.71591	781139.586	12.07216427	12072.16427		781139.586			
Riverside (SC)	2027	LDT1	Aggregate	Aggregate	Gasoline	38425.04641	1456606.871	56.00411545	56004.11545	56110.21758	1456606.871	1471112.371	26.22	LDT1
Riverside (SC)	2027	LDT1	Aggregate	Aggregate	Diesel	8.182997029	149.5948697	0.005861932	5.861931679		149.5948697			
Riverside (SC)	2027	LDT1	Aggregate	Aggregate	Electricity	147.7776311	7209.101259	0	0		7209.101259			
Riverside (SC)	2027	LDT1	Aggregate	Aggregate	Plug-in Hybrid	130.963565	7146.803489	0.100240199	100.2401989		7146.803489			
Riverside (SC)	2027	LDT2	Aggregate	Aggregate	Gasoline	212339.9735	9414153.484	360.272054	360272.054	363211.8816	9414153.484	9671400.198	26.63	LDT2
Riverside (SC)	2027	LDT2	Aggregate	Aggregate	Diesel	713.6192887	33073.61643	0.942826085	942.8260853		33073.61643			
Riverside (SC)	2027	LDT2	Aggregate	Aggregate	Electricity	2564.171691	88062.50525	0	0		88062.50525			
Riverside (SC)	2027	LDT2	Aggregate	Aggregate	Plug-in Hybrid	2628.969244	136110.5925	1.997001514	1997.001514		136110.5925			
Riverside (SC)	2027	LHDT1	Aggregate	Aggregate	Gasoline	17212.0897	642894.8546	44.12357644	44123.57644	69419.14823	642894.8546	1201022.641	17.30	LHDT1
Riverside (SC)	2027	LHDT1	Aggregate	Aggregate	Diesel	14633.12771	526713.4197	25.29557179	25295.57179		526713.4197			
Riverside (SC)	2027	LHDT1	Aggregate	Aggregate	Electricity	492.5286755	31414.36647	0	0		31414.36647			
Riverside (SC)	2027	LHDT2	Aggregate	Aggregate	Gasoline	2393.256129	85530.68603	6.657949773	6657.949773	20539.98243	85530.68603	334771.945	16.30	LHDT2
Riverside (SC)	2027	LHDT2	Aggregate	Aggregate	Diesel	6722.419556	241624.1987	13.88203265	13882.03265		241624.1987			
Riverside (SC)	2027	LHDT2	Aggregate	Aggregate	Electricity	125.2869519	7617.060264	0	0		7617.060264			
Riverside (SC)	2027	MCY	Aggregate	Aggregate	Gasoline	23872.84416	135933.3741	3.223711537	3223.711537	3223.711537	135933.3741	135933.3741	42.17	MCY
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Gasoline	157494.1298	6421344.406	307.9749594	307974.9594	313073.5241	6421344.406	6696600.902	21.39	MDV
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Diesel	2354.829343	94400.81381	3.800171132	3800.171132		94400.81381			
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Electricity	2779.433972	95116.63714	0	0		95116.63714			
Riverside (SC)	2027	MDV	Aggregate	Aggregate	Plug-in Hybrid	1757.393907	85739.04462	1.298393545	1298.393545		85739.04462			
Riverside (SC)	2027	MH	Aggregate	Aggregate	Gasoline	4014.402617	34124.53465	6.984241305	6984.241305	8533.923074	34124.53465	50163.52077	5.88	MH
Riverside (SC)	2027	MH	Aggregate	Aggregate	Diesel	1945.315043	16038.98612	1.549681769	1549.681769		16038.98612			
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Gasoline	1187.040113	49189.22554	9.102215369	9102.215369	74108.25298	49189.22554	657629.6251	8.87	MHDT
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Diesel	13823.92114	580928.627	64.04015234	64040.15234		580928.627			
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Electricity	371.8319942	18951.18768	0	0		18951.18768			
Riverside (SC)	2027	MHDT	Aggregate	Aggregate	Natural Gas	191.1860259	8560.584881	0.965885278	965.8852775		8560.584881			
Riverside (SC)	2027	OBUS	Aggregate	Aggregate	Gasoline	338.9861834	11067.86494	2.084603884	2084.603884	4234.382771	11067.86494	29125.06177	6.88	OBUS
Riverside (SC)	2027	OBUS	Aggregate	Aggregate	Diesel	234.5197906	15307.11304	1.914675461	1914.675461		15307.11304			
Riverside (SC)	2027	OBUS	Aggregate	Aggregate	Electricity	5.428935287	350.8664874	0	0		350.8664874			
Riverside (SC)	2027	OBUS	Aggregate	Aggregate	Natural Gas	40.94802157	2399.217305	0.235103425	235.1034253		2399.217305			
Riverside (SC)	2027	SBUS	Aggregate	Aggregate	Gasoline	430.4295714	17027.29145	1.934694955	1934.694955	5925.808471	17027.29145	38269.32872	6.46	SBUS
Riverside (SC)	2027	SBUS	Aggregate	Aggregate	Diesel	464.1146803	9303.444431	1.262004708	1262.004708		9303.444431			
Riverside (SC)	2027	SBUS	Aggregate	Aggregate	Electricity	14.63497518	401.3400131	0	0		401.3400131			
Riverside (SC)	2027	SBUS	Aggregate	Aggregate	Natural Gas	486.6196132	11537.25282	2.729108808	2729.108808		11537.25282			
Riverside (SC)	2027	UBUS	Aggregate	Aggregate	Gasoline	147.0093126	18606.89257	3.253359958	3253.359958	10959.60845	18606.89257	49932.35462	4.56	UBUS
Riverside (SC)	2027	UBUS	Aggregate	Aggregate	Diesel	0.3117338	30.10971099	0.002674823	2.674822746		30.10971099			
Riverside (SC)	2027	UBUS	Aggregate	Aggregate	Electricity	0.589513765	89.99316283	0	0		89.99316283			
Riverside (SC)	2027	UBUS	Aggregate	Aggregate	Natural Gas	253.257931	31205.35917	7.703573673	7703.573673		31205.35917			

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UPDATED GEOTECHNICAL EVALUATION
PROPOSED SINGLE-FAMILY RESIDENTIAL DEVELOPMENT
APNS 245-300-001 AND -004
NORTHWEST OF IRIS AVENUE AND CHICAGO AVENUE
WOODCREST AREA OF RIVERSIDE COUNTY, CALIFORNIA

PREPARED FOR

TTLC MANAGEMENT, INC., AN ARIZONA CORPORATION
2942 CENTURY PLACE, SUITE 121
COSTA MESA, CALIFORNIA 92626

PREPARED BY

GEOTEK, INC.
1548 NORTH MAPLE STREET
CORONA, CALIFORNIA 92878

PROJECT NO. 2855-CR **SEPTEMBER 21, 2021**

GEOTEK

GeoTek, Inc.
1548 North Maple Street, Corona, California 92878
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September 21, 2021
Project No. 2855-CR

TTLC Management, Inc., an Arizona Corporation
2942 Century Place, Suite 121
Costa Mesa, California 92626

Attention: Mr. Michael Torres

Subject: Updated Geotechnical Evaluation
Proposed Single-Family Residential Development
APN 245-300-001 and -004
Northwest of Iris Avenue and Chicago Avenue
Woodcrest Area of Riverside County, California

Dear Mr. Torres:

GeoTek, Inc. (GeoTek) is pleased to provide the results of this updated geotechnical evaluation for the subject project located north of Iris Avenue and west of Chicago Avenue, in the Woodcrest area of Riverside County, California. This report presents the results of GeoTek's evaluation and discussion of findings.

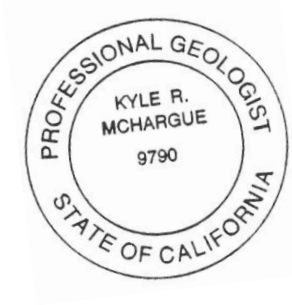
Based upon review, it is GeoTek's opinion that site development appears feasible from a geotechnical viewpoint. Final site development and grading plans should be reviewed by this firm as they become available, as it will be necessary to provide appropriate recommendations for intended specific site development as those plans become refined.

The opportunity to be of service is sincerely appreciated. If you should have any questions, please do not hesitate to call GeoTek.

Respectfully submitted,
GeoTek, Inc.

Edward H. LaMont
CEG 1892, Exp. 07/31/22
Principal Geologist

Bruce C. Hick
GE 3133, Exp. 12/31/22
Project Engineer



Kyle R. McHargue
PG 9790, Exp. 02/28/22
Project Geologist

Distribution: (1) Addressee via email

G:\Projects\2851 to 2900\2855CR The True Life Companies NW Iris Ave & Chicago Ave Woodcrest\Geo\2855-CR Updated Geotechnical Evaluation APN 245-300-001 and -004 GEO.doc

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ENCLOSURES

Figure 1 – Site Location Map

Figures 2 – Exploration Location Map

Appendix A – Exploration Logs, Laboratory Test Results and Seismic Refraction Survey Data by Earth Strata (2015)

Appendix B – Logs of Exploratory Trenches by GeoTek

Appendix C – Laboratory Test Results by GeoTek

Appendix D – Seismic Refraction Survey Results by GeoTek

Appendix E – General Grading Guidelines

1. PURPOSE AND SCOPE OF SERVICES

The purpose of this study was to evaluate the general geotechnical conditions on the site and provide updated geotechnical recommendations as deemed appropriate. Services for this study included the following:

- Research and review of available geologic and geotechnical data, and past reports pertinent to the site,
- Perform a reconnaissance of the site,
- Excavation of eleven (11) exploratory trenches to assess the general subsurface soil and bedrock conditions and rock hardness at the property,
- A seismic refraction survey, performed by a subconsultant, to further evaluate rock excavatability,
- Collection of bulk samples of the onsite materials for laboratory testing,
- Laboratory testing,
- Review and evaluation of site seismicity, and
- Compilation of this updated geotechnical evaluation report which presents GeoTek's findings, conclusions, and recommendations for the site development.

The intent of this report is to aid in the evaluation of the site for future development from a geotechnical perspective. The professional opinions and geotechnical information contained in this report will likely need to be updated based on review of final site development plans. These should be provided to GeoTek for review when available.

2. SITE DESCRIPTION AND PROPOSED DEVELOPMENT

2.1 SITE DESCRIPTION

The project site consists of two parcels of land identified as Riverside County Assessor's Parcel Numbers (APNs) 245-300-001 (119.0-acres) and 245-300-001 (19.99-acres) (See Figure 1). The site is located at the northwest corner of Iris Avenue and Chicago Avenue, in the Woodcrest area of Riverside County, California. The majority of the property is currently

gently-rolling vacant land that was previously utilized as an agricultural orchard. The orchard trees, including visible tree stumps, appeared to have been removed at the time of the field exploration. In addition, there currently is a single-family residence and three outbuildings in the east-central portion of the site. The northwest portion of the subject site is hillside terrain that is currently vacant and does not appear to have been utilized as an agricultural orchard.

There is an existing incised drainage course trending southeast to northwest that meanders through the central portion of the site. Furthermore, several granitic bedrock outcrops were visible throughout the central and northwest portions of the property.

The subject site is bounded by residential development and vacant land to the north; Chicago Avenue, followed by residential development to the east; Iris Avenue, followed by residential development to the south; and vacant land to the west.

2.2 PROPOSED DEVELOPMENT

The *Master Plan*, prepared by Urban Arena and dated August 10, 2021 ("Chicago 139"), indicates that the site development will consist of the construction of 276 single-family residences, a neighborhood park, open spaces, interior streets, and underground utilities. In addition, a pedestrian bridge over the drainage course and multi-purposes trails are proposed. The existing drainage channel will remain undeveloped and will act as a natural drainage course (see Figure 2).

It is anticipated that the residential structures will be one and/or two stories in height utilizing conventional shallow footings with slab-on-grade. Sewage disposal is to be by a public sewer system.

The inclusion and/or location of water quality basins are not known at this time. As such, infiltration testing was not included in this evaluation.

If site development differs from the assumptions made herein, the recommendations included in this report should be subject to further review and evaluation. Final site development plans should be reviewed by GeoTek when they become available. Additional geotechnical field exploration, analyses, and recommendations may be necessary upon review of site development plans.

3. REPORT REVIEW

On April 27, 2015, Earth-Strata, Inc. (Earth-Strata) issued a *Revised Preliminary Geotechnical Interpretive Report* (Earth-Strata, 2015a) for a portion of the subject site. Earth-Strata's report pertained exclusively to APN 245-300-001 (See Figure 1). Earth-Strata's subsurface investigation consisted of the excavation of eight (8) hollow-stem auger borings to a maximum depth of 10 feet. Additionally, a backhoe was utilized to excavate 18 test pits to a maximum depth of 6 feet throughout the development areas. Earth-Strata indicated that their explorations encountered "surficial" deposits (topsoil), quaternary-age alluvium and Cretaceous-age Tonalite bedrock of the Val Verde Formation within the proposed site development area. The alluvium was encountered to the maximum depth explored and generally consisted of silty sand (SM soil type based upon the Unified Soil Classification System). The tonalite bedrock was generally found to be moderately hard to very hard and typically weathered in the upper 1 to 4 feet.

Earth-Strata concluded that there are no known faults that project through the site and the site is not located within an Alquist-Priolo Earthquake Fault Zone. No landslides were identified on the site by Earth-Strata.

Earth-Strata concluded that the subject property is considered suitable for the proposed development and offered numerous earthwork recommendations. The consultant stated that the near surface earth materials except in areas of rock outcrops will be readily excavated with conventional earth moving equipment. However, the consultant noted that sewer lines may be in excess of 25 feet deep on the west portion of the site and should be further investigated with seismic refraction lines.

Groundwater was not encountered by Earth-Strata during their subsurface exploration. However, water was noted within the drainage channel that trends through the middle of the project site.

Earth-Strata recommended the removal of topsoil, alluvial materials and artificial fill down to competent bedrock. Removals were anticipated to be about 2 to 4 feet deep across much of the site, with localized areas up to 6 to 8 feet within the orchard areas. Properly constructed fill slopes and cut slopes up to 20 feet high with inclinations of 2:1 (horizontal:vertical) are considered to be grossly stable.

The evaluation estimated a shrinkage factor of 5 to 10 percent for the artificial fill and 0 to 5 percent for the bedrock. No shrinkage values were given for the alluvial materials. Earth-Strata stated the subsidence is estimated to be negligible to 0.01 feet.
The Earth Strata report estimated that the on-site materials have a "very low" to "low" expansion index and recommended confirmation after grading. Soils were encountered to have "negligible" soluble sulfate contents and to be "corrosive" to "very corrosive" to common metallic components. Earth-Strata recommended that additional corrosion testing be conducted at the completion of the site grading.

Earth-Strata provided geotechnical parameters for design of both conventionally reinforced shallow foundations and post-tensioned slab systems for soils having "very low" to "low" expansion index potential.

Copies of the excavation logs, seismic refraction lines, and laboratory test results by Earth-Strata are included in Appendix A. The locations of Earth-Strata's excavations are shown on Figure 2.

On June 8, 2015, Earth-Strata issued a *Seismic Refraction Survey* (Earth-Strata, 2015b) for a portion of the subject site. Earth-Strata's report pertained exclusively to APN 245-300-001 (See Figure 1). Earth-Strata completed a total of four (4) seismic refraction survey lines each totaling 150 feet in length. The seismic line locations are shown on Figure 2.

Earth-Strata concluded that minor excavation difficulties are to be expected in the uppermost 2 feet to 10 feet. However, areas of surficial bedrock outcropping may require more significant excavation techniques. Within the areas of seismic line 1, areas as shallow as 2 feet to 5 feet and as deep as 40 feet are expected to be excavated with moderately difficult conditions utilizing appropriately sized good working equipment.

Earth-Strata concluded that locally areas referred to as "floaters" and/or "corestones" should be expected and will likely cause difficult excavation conditions. Placement of infrastructure within these areas may require some breaking and/or light blasting to obtain desired grades. Additionally, Earth-Strata concluded that areas with seismic velocities less than 6,800 feet per second (fps) are generally noted to be within the threshold for conventional ripping.

Copies of the seismic refraction survey data by Earth-Strata are included in Appendix A.

4. FIELD EXPLORATION AND LABORATORY TESTING

4.1 FIELD EXPLORATION

To supplement the existing subsurface exploration by Earth-Strata and to assess previously unexplored areas of the proposed development, GeoTek excavated nine (9) exploratory trenches on August 30, 2021. The trenches extended to depths ranging from about 5 to 14 feet below existing grades and were excavated to log the subsurface materials and examine the rippability and/or hardness of localized areas throughout the site. The trenches were excavated by a backhoe.

A seismic refraction survey was conducted on August 12, 2021 by a subconsultant (Subsurface Surveys & Associates, Inc.). The seismic refraction survey involved the recording and measuring of man-made energy waves from seven (7) seismic refraction and tomography lines placed in site areas where deep excavations are proposed, as discussed with the project civil engineer. The seismic survey summary report is included in Appendix D of this report.

The approximate locations of GeoTek's site explorations are shown on the Exploration Location Map, Figure 2. Logs of the explorations by Earth Strata, in addition to the trenches and seismic refraction lines by GeoTek, are provided in Appendices A and B, respectively.

4.2 LABORATORY TESTING

Laboratory testing was performed on selected bulk and relatively undisturbed soil and bedrock samples collected during the field exploration. The purpose of the laboratory testing was to confirm the field classification of the subsurface materials encountered and to evaluate the soil/bedrock physical properties for use in the engineering design and analysis. GeoTek's test results along with a brief description and relevant information regarding testing procedures are included in Appendix C.

5. GEOLOGIC AND SOILS CONDITIONS

5.1 REGIONAL SETTING

The subject property is situated in the Peninsular Ranges geomorphic province. The Peninsular Ranges province is one of the largest geomorphic units in western North America. It extends from the point of contact with the Transverse Ranges geomorphic province, southerly to the tip of Baja California. This province varies in width from about 30 to 100 miles. It is bounded on the west by the Pacific Ocean, on the south by the Gulf of California and on the east by the Colorado Desert Province.

The Peninsular Ranges are essentially a series of northwest-southeast oriented fault blocks. Several major fault zones are found in this province. The Elsinore Fault zone and the San Jacinto Fault zone trend northwest-southeast and are mostly found near the middle of the province. The San Andreas Fault zone borders the northeasterly margin of the province, and the San Jacinto fault borders the province adjacent the Colorado Desert province.

More specific to the subject property, the site is located within a large structural mass known as the Perris Block of the Peninsula Ranges providence. The Perris Block is a relatively stable mass of granitic bedrock that in places is overlain by alluvium and thin sedimentary and volcanic units. After formation of granitic rocks, the Perris Block experienced vertical movements that produced nearly flat erosional surfaces. Sediments emanating from the elevated portions of the Perris Block filled low lying areas of the region. The project area is in an area geologically mapped by others to be underlain by granitic bedrock (tonalite, Dibblee, T.W. and Minch, J.A., 2004).

No active faults are shown in the immediate site vicinity on the maps reviewed for the area. The site is not located within an Earthquake Fault Zone (Alquist-Priolo) as designated by the State of California. The Riverside County website (https://gis.countyofriverside.us/) has designated the site as "not in a fault zone", "not in a fault line", "not in a liquefaction area", and "not in a subsidence area".

5.2 EARTH MATERIALS

A brief description of the earth materials reported to be on the site by Earth-Strata (2015) and encountered in GeoTek's explorations is presented in the following sections.

5.2.1 Disturbed Soil/Undocumented Fill/Topsoils

Earth-Strata and GeoTek observations noted the presence of topsoil and disturbed soil/undocumented fill ("surficial") soils throughout the site. The surficial soils generally consist of silty and clayey sands and sandy silts (SM, SC, and ML soil types based upon the Unified Soil Classification System) which are predominately brown in color and loose/very soft to medium dense/stiff in consistency. The thickness of the surficial soils ranged from about 1 to 3 feet. However, the composition and thickness of the on-site surficial soils could be highly variable.

5.2.2 Quaternary Alluvium

Quaternary-aged alluvium was encountered in most of the Earth-Strata and GeoTek explorations. These alluvial deposits consist predominately of brown, fine to coarse-grained sands, silty sands, clayey sands and sandy silts (SP, SM, SC and ML soil types). These deposits were found to be in a loose/soft to medium dense/stiff state. The thickness of the alluvium ranged up to approximately 7 feet near the toes of slopes and 8 feet in the drainage courses.

5.2.3 Cretaceous Val Verde Tonalite

The Val Verde Tonalite was mapped within the site and underlies the surficial and alluvial deposits. Tonalite has a similar chemical composition to gabbro but includes a higher percentage of quartz. The Val Verde Tonalite was generally noted to be light gray to yellowish tan and was found to be in a moderately hard to very hard state. The bedrock was generally massive and lacks significant structural planes. Typically, the upper approximate three to four feet of the bedrock was found to be moderately to severely weathered and not as hard. The weathered granitic material consisted of massive, slightly friable fine to very coarse-grained sand when excavated ("Decomposed Granite" (DG)). The bedrock becomes less weathered with depth. Most of GeoTek's trench excavations were terminated due to refusal in the tonalite.

As part of GeoTek's services for this report, a seismic refraction survey was performed by Subsurface Surveys & Associates, Inc. on the site. As part of this survey, seven (7) seismic lines were recorded at various site locations. The results of the seismic refraction survey are presented in Appendix D.

GeoTek's seismic refraction survey performed within planned deep cut areas or areas with deep utilities proposed, as shown on Figure 2, identified three layers of subsurface materials. The uppermost zone comprises alluvial soil (colluvium) and is estimated to extend up to 10 feet below grade. The middle layer was noted to correspond to weathered bedrock with velocities ranging from 3,027 to 4,408 feet per second (fps). The bottom layer was noted to comprise slightly weathered to unweathered bedrock. Results of the seismic refraction survey are provided in Appendix C.

Earth-Strata's seismic refraction survey was performed within APN 245-300-001, as shown on Figure 2, identified three major layers of subsurface materials. The uppermost zone comprises alluvial and colluvium and/or completely weathered bedrock and was estimated to extend up to 10 feet below grade. This layer was estimated to be excavatable with only minor difficulties. However, localized boulders should be anticipated based on surficial exposures which may require more significant excavation techniques.

The middle layer, which starts as shallow as 2 to 5 feet and extended in excess of 40 feet below existing grade, consists of slightly to highly weathered bedrock. This layer is expected to be excavated with moderate conditions, assuming appropriately sized good working equipment. Isolated floaters (i.e., boulders, corestones, etc.) should be expected to be present within this second layer which could produce somewhat difficult conditions locally. Placement of infrastructure within this layer may require some breaking and/or light blasting to obtain desired grades.

The third layer starts at depths of 2 to 30 feet below existing grade, consists of moderately to unweathered bedrock. Placement of infrastructure within this layer may require some localized blasting to obtain desired grades. Results of Earth-Strata's seismic refraction survey are provided in Appendix A.

Based on the results of laboratory testing by Earth-Strata and GeoTek, the surficial soils are considered to have a "very low" (0-20) to "low" (21-50) expansion potential (ASTM D 4829). Based on the laboratory test results, the near surface soils have a soluble sulfate content of less than 0.1 percent (ASTM D 4327). The test results are provided in Appendix A (Earth-Strata) and Appendix C (GeoTek).

Detailed logs of the subsurface conditions of the site are presented in Appendix A (Earth-Strata) and Appendix B (GeoTek).

5.3 SURFACE WATER AND GROUNDWATER

5.3.1 Surface Water

Surface water was not noted during GeoTek's field investigation. However, water was observed within the drainages during Earth Strata's field exploration. If encountered during earthwork construction, surface water on this site is the result of precipitation or possibly some minor surface run-off from immediately surrounding properties. Overall site area drainage is generally to the north/northwest, as directed by site topography. As previously

discussed, a "blue-line" drainage trends northwest through the central portion of the site. Provisions for surface drainage will need to be accounted for by the project civil engineer.

5.3.2 Groundwater

Groundwater was encountered at a depth of approximately 6.5 feet below the existing ground surface in Trench T-5 at the time of exploration. This groundwater appears to be the result of a perched condition. Groundwater was not encountered in any other trenches excavated by GeoTek for this project. Groundwater was not encountered by Earth Strata (2015a) to an explored depth of 10 feet. The California Department of Water Resources, Water Data Library indicates that the presence of various groundwater wells within a one-mile radius from the site. Records for these wells show depths to groundwater in excess of 100 feet. Based on the above, groundwater is not anticipated to be a factor during the site grading. However, seasonal perched groundwater may be encountered during grading within portions of the site.

5.4 FAULTING AND SEISMICITY

The geologic structure of the entire southern California area is dominated mainly by northwest-trending faults associated with the San Andreas system. The site is in a seismically active region. No active or potentially active fault is known to exist at this site nor is the site situated within a State of California designated *"Alquist-Priolo"* Earthquake Fault Zone (Bryant and Hart, 2007; CGS, 1986).

The County of Riverside has designated the site as "not in a fault zone" and "not in a fault line." The nearest known active faults are the Elsinore fault zone and the San Jacinto fault zone located approximately 11.4 and 11.2 miles to the southwest and northeast of the site, respectively.

5.4.1 Seismic Design Parameters

The site is located at approximately 33.8902 North Latitude and -117.3516 West Longitude. A Site Class "C" is considered appropriate due to the presence of shallow bedrock across the site. Site spectral accelerations (S_a and S_1), for 0.2 and 1.0 second periods for a Class "C" site, were determined from the SEAOC/OSHPD web interface that utilizes the USGS web services and retrieves the seismic design data and presents that information in a report format. The results are presented in the following table:

SITE SEISMIC PARAMETERS	
Mapped 0.2 sec Period Spectral Acceleration, S_S	1.5g
Mapped 1.0 sec Period Spectral Acceleration, S_1	0.562g
Site Coefficient for Site Class "C", F_a	1.2
Site Coefficient for Site Class "C", F_v	1.438
Maximum Considered Earthquake Spectral Response Acceleration for 0.2 Second, S_{MS}	1.8g
Maximum Considered Earthquake Spectral Response Acceleration for 1.0 Second, S_{M1}	0.809g
5% Damped Design Spectral Response Acceleration Parameter at 0.2 Second, S_{DS}	1.2g
5% Damped Design Spectral Response Acceleration Parameter at 1 second, S_{D1}	0.539g
Site Modified Peak Ground Acceleration, PGA_M	0.6g

Final selection of the appropriate seismic design coefficients should be made by the project structural engineer based upon the local practices and ordinances, expected building response and desired level of conservatism.

5.4.2 Surface Fault Rupture

The site is in a seismically active region; however, no active or potentially active fault is known to exist at this site nor is the site situated within an *"Alquist-Priolo"* Earthquake Fault Zone (Bryant and Hart, 2007). No faults are identified on geologic maps readily available and reviewed by this firm for the immediate study area. The nearest known active faults are the Elsinore fault zone and the San Jacinto fault zone located approximately 11.4 and 11.2 miles to the southwest and northeast of the site, respectively.

5.4.3 Liquefaction and Seismically Induced Settlement

The County of Riverside has designated the site as being "not in a liquefaction area" and "not in a subsidence area".

Liquefaction is not considered to be a hazard at the subject site due the lack of a true groundwater level within the site, presence of shallow bedrock, and proposed remedial grading. Also, the potential for seismically induced settlement at the property is considered to be nil to very low due to the presence of shallow bedrock and proposed remedial grading.

5.4.4 Other Seismic Hazards

Evidence of ancient landslides or slope instabilities at this site was not observed during the field investigation. Thus, the potential for landslides is considered negligible.

The potential for secondary seismic hazards such as a seiche or tsunami is considered negligible due to site elevation and distance to an open body of water.

As previously discussed, bedrock (tonalite) outcrops are present on portions of the site. As previously noted, the tonalite is generally massive and lacks significant structural planes. In addition, the site topography is relatively gentle with a moderate slope to the north/northwest. Based upon this condition, the rock fall hazard at the site is not a design consideration for this project.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 GENERAL

Development of the site appears feasible from a geotechnical viewpoint. The following recommendations should be incorporated into the design and construction phases of development.

6.2 EARTHWORK CONSIDERATIONS

6.2.1 General

Earthwork and grading should be performed in accordance with the applicable grading ordinances of the County of Riverside, the 2019 California Building Code (CBC), and recommendations contained in this report. The General Grading Guidelines included in Appendix E outline general procedures and do not anticipate all site-specific situations. In the event of conflict, the recommendations presented in the text of this report should supersede those contained in Appendix E.

Final site grading plans should be reviewed by this office when they become available. Additional recommendations will likely be offered subsequent to review of these plans.

6.2.2 Site Clearing

Site preparation should start with removal of any existing improvements, deleterious materials, and vegetation within the planned development areas of the site. These materials should be properly disposed of off-site.

6.2.3 Remedial Grading

The trenches excavated during this evaluation and likely the previous trenches performed by Earth Strata were backfilled without compaction effort. All trench backfill should be entirely removed and replaced with engineered compacted fill.

All topsoil, disturbed soil/undocumented fill ("surficial") soils, loose alluvium, and highly weathered bedrock should be removed to expose competent native materials. Competent native materials are defined as either relatively dense alluvium, which is relatively uniform, not visibly porous, and having an in-place compaction of at least 85 percent of the soil's maximum dry density (per ASTM D 1557 test procedures) or firm, unyielding bedrock. Estimated removal depths are anticipated to range from 2 to 4 feet within "bedrock" areas and 6 to 8 feet within "alluvial" areas.

Actual depths of removals should be determined in the field based on observation and in-place density testing. A representative of this firm should observe and approve the bottom of all excavations. As a minimum, removals should extend down and away from foundation elements at a 1:1 (horizontal:vertical) projection to the recommended removal depth, or a minimum of five feet laterally, whichever is greater. The bottom of the removals should be graded to drain toward the front of the lot at a gradient of at least two percent.

Project rough grading will create fill, cut/fill transition and cut building pads. All pads in fill should be overexcavated such that the pads are underlain by at least five feet of engineered fill and over-excavation bottoms should slope to drain to the adjacent street of suitable direction so ponding of water is not likely. In addition, the minimum fill thickness should be at least one-half of the maximum fill thickness under the pad, up to a maximum of 15 feet. The lateral extent of this recommendation should include an area of at least 5 feet beyond the building limits.

The cut portions of transition (i.e., cut/fill) pads should be overexcavated a minimum of five feet below proposed grades or to a depth of one-half the maximum fill thickness.

All building pads in cut areas exposing tonalite bedrock should be overexcavated to a minimum depth of three feet below proposed grade and replaced with engineered fill.

The base of all project footings should be underlain by at least 24 inches of engineered compacted fill.

In order to facilitate footing excavation and installation of house services, consideration should be given to over-excavating cut lots to a minimum depth of five feet below proposed finished grades. It is recommended that the entire lot be over-excavated. It is also recommended that utility alignments be over-excavated to at least one foot below the depth of the lowest underground utility.

To prevent potential differential settlement, the cut portions of transition (i.e., cut/fill) lots should be over-excavated a minimum of five feet below proposed grades or to a depth of one-half of the maximum fill thickness on the lot, whichever is greater. The horizontal extent of over-excavation could comprise the entire lot or extend at least five feet outside the structural area, or a distance equal to the depth of over-excavation below the bottom of the structural elements, whichever is greater. Over-excavation bottoms should be graded to drain toward the front of the lot (two percent minimum).

The approved removal/over-excavation bottom exposed should then be scarified to a depth of about six inches, be moisture conditioned to slightly above the soil's optimum moisture content and then be compacted to at least 90 percent of the soil's maximum dry density as determined by ASTM D 1557 test procedures. Compaction should be confirmed by testing.

6.2.4 Excavation Characteristics

As previously discussed, excavation up to approximately 25 feet or less will be needed for localized areas of infrastructure (sewer line) construction. Based upon results of GeoTek's and Earth Strata's exploration, backhoe and drill rigs met shallow refusal in bedrock. In addition, bedrock outcrops were present on portions of the site.

As part of GeoTek's services for this report, a seismic refraction survey was performed by Subsurface Surveys & Associates, Inc. on the site. As part of this survey, seven (7) seismic lines were recorded at various site locations. The results of the seismic refraction survey are presented in Appendix D. Earth-Strata's seismic refraction survey was performed within APN 245-300-001, as shown on Figure 2. The results of Earth Strata's seismic refraction survey are presented in Appendix A.

A brief discussion of the results of the seismic refraction surveys performed by Earth Strata and GeoTek was provided in Section 5.2.3. of this report. Much of the rock at the site is extremely hard and relatively unfractured, with bedrock outcrops present on the site. Some blasting or special excavation techniques will likely be required to complete the proposed project grading and infrastructure construction.

The above evaluation of rock hardness is based on review of previous studies performed for the site and the recently performed seismic refraction survey. It should be realized that the ability of any particular contractor to excavate the materials encountered will vary based on factors that may or may not be considered in the evaluation. All methods available to evaluate rock hardness and associated rippability are interpretive to some extent. As such, experience and judgment are primary factors in such evaluations.

Utility excavation is expected to be challenging due to the presence of hard rock. Extensive blasting or special excavation techniques should be anticipated to perform the utility infrastructure of this project. It is recommended that utility corridors within streets be over-excavated to at least 1 foot below the deepest utility and backfilling with compacted soil. Oversized rocks (>6 inches) should be anticipated on this site and hard floaters/corestones may be encountered at varying depths during grading and/or blasting operations. A caving or loosening of bedrock often known as "overbreak" of utility trench excavations is expected in excavations into the tonalite bedrock.

Overexcavation of street areas underlain by bedrock during rough grading should be considered to prevent significant trenching difficulties associated with utility installations. The overexcavation should extend to a depth of at least one foot below the deepest planned utility and then be backfilled with properly compacted fill.

Excavation of alluvial deposits to the design elevations is expected to be feasible with heavy-duty grading equipment in good operating condition. All temporary excavations for grading purposes and installation of underground utilities should be constructed in accordance with local and Cal-OSHA guidelines. Temporary excavations within the on-site materials should be stable at 1:1 (horizontal:vertical) inclinations for cuts less than ten feet in height.

Based on the soils encountered in the various site explorations, site earth materials can be categorized as OSHA Soil Type C. It is recommended that temporary slopes greater than four feet in height not be constructed at inclinations steeper than 1:1 (horizontal:vertical). Flatter inclinations may be needed depending on the field conditions. Temporary construction slopes should be periodically examined by a competent person, per OSHA requirements, to look of evidence of instability.

6.2.5 Canyon Subdrains

Subdrains are recommended within the bottom of the existing major drainage swales/canyons in areas where the depth of fill will exceed 10 feet in thickness. The subdrains should consist of 6-inch diameter (subdrain length less than 500 feet) or 8-inch diameter (lengths greater than

500 feet) Schedule 40 perforated PVC pipe encapsulated within 9 cubic feet of suitable drainage material (¾ inch open graded rock, or equivalent) surrounded by a filter fabric, such as Mirafi 140N, or equivalent. Where possible, the subdrains should be installed within the bottom of the canyon cleanouts. The subdrains should be installed with a minimum 1 percent gradient sloping to an approved outlet. The final 10 feet of pipe, where connecting to an outlet, should consist of solid PVC pipe. A subdrain detail is shown on Plate E-1 in Appendix E.

6.2.6 Slope Construction

Cut slopes constructed in bedrock at maximum gradients of 2:1 (horizontal:vertical), in accordance with industry standards, are anticipated to be both grossly and surficially stable. Cut slopes constructed at maximum gradients of 2:1 (horizontal:vertical) in suitable alluvial soils, in accordance with industry standards, are anticipated to be both grossly and surficially stable. An engineering geologist should observe all cut slopes. Cut slopes should expose competent bedrock (defined as tonalite) or suitable alluvium. If adverse structure or incompetent materials are exposed and identified in the cut slopes, stabilization fills may be recommended. Where alluvial soils are present over bedrock in the cut slope, the alluvial portion of the slope should be reconstructed as a surficial stability fill.

Swales should be constructed at the top of all cut slopes to collect and divert drainage away from the slope face. Drainage should be directed to an approved drainage discharge location. Swales should be constructed with concrete, shotcrete or approved non-erosive material. Swales should be cleaned of loose soil and debris on an on-going basis.

Fill slopes constructed at maximum gradients of 2:1 (horizontal:vertical), in accordance with industry standards, are anticipated to be both grossly and surficially stable. Where fill is to be placed against sloping terrain with gradients of 5:1 (horizontal:vertical) or steeper, the sloping ground surface should be benched to remove loose and disturbed surface soil to assure that the new fill is placed in direct contact with competent bedrock and to provide horizontal surfaces for fill placement. A 10- to 15-foot-wide keyway should be constructed at the toe of the fill slope areas extending at least 2 to 3 feet vertically into competent natural material.

The base of the keyways and benches should be sloped back into the hillside at a gradient of at least two percent. The base of the benches should be evaluated by a representative of GeoTek prior to processing. Upon approval, the exposed materials should be moistened to at least the optimum moisture content and densified to a relative compaction of at least 90 percent of maximum dry density as determined by ASTM D 1557 test procedures.

Fill slopes should be overfilled during construction and then cut back to expose fully compacted soil. A suitable alternative would be to compact the slopes during construction and then roll the final slope to provide a dense, erosion resistant surface.

Berms should be constructed and maintained at the top of all slopes to divert drainage away from the slope faces. An abatement program to control ground-burrowing rodents should be implemented and maintained. Burrowing rodents can decrease the long-term performance of slopes.

6.2.7 Engineered Fill

The onsite materials are considered suitable for reuse as engineered fill provided the materials are free from vegetation, roots, and rock/hard lumps greater than six inches in maximum dimension.

Prior to placing fill, the approved exposed subgrade should then be scarified to a depth of about 12 inches, be moisture conditioned to slightly above the soil's optimum moisture content and then be compacted to at least 90 percent of maximum dry density as determined by ASTM D 1557 test procedures.

The undercut areas should be brought to final subgrade elevations with fill materials that are placed and compacted in general accordance with minimum project standards. Engineered fill should be placed in six- to eight-inch loose lifts, moisture conditioned to slightly above optimum moisture content, and compacted to a minimum relative compaction of 90 percent as determined by ASTM D 1557 test procedures. If engineered fill depths exceed 50 feet, the engineered fill below a depth of 50 feet from finish grade should be compacted to a minimum relative compaction of 95 percent as determined by ASTM D 1557. Fills deeper than 30 feet from finish grade should be compacted to a minimum relative compaction of 93 percent. Placement of engineered fill should be observed and tested on a full-time basis by a GeoTek representative during grading activities.

The site excavations noted that the bedrock generally breaks down to sand and gravel with trace of boulders and cobbles up to 2 feet in maximum dimension. Occasional cobbles and boulders were also encountered in the deeper portions of the alluvium. Oversized materials (greater than six inches) should be placed scattered (windrows) on site as detailed in Appendix E and Figure E-4. Alternatively, oversized rock could be disposed of offsite or stockpiled on site and crushed for future use.

6.2.8 Trench Excavations and Backfill

Temporary trench excavations within the on-site materials should be stable at 1:1 (h:v) inclinations for short durations during construction and where cuts do not exceed ten feet in height. It is anticipated that temporary cuts to a maximum height of four feet can be excavated vertically.

Trench excavations should conform to Cal-OSHA regulations. The contractor should have a competent person, per OSHA requirements, on site during construction to observe conditions and to make the appropriate recommendations.

Utility trench backfill should be compacted to at least 90 percent relative compaction (as determined per ASTM D 1557 test procedures). Under-slab trenches should also be compacted to project specifications. Where applicable, based on jurisdictional requirements, the top 12 inches of backfill below subgrade for road pavements should be compacted to at least 95 percent relative compaction. On-site materials may not be suitable for use as bedding material but should be suitable as backfill provided particles larger than six inches are removed.

Compaction should be achieved with a mechanical compaction device. Ponding or jetting of trench backfill is not recommended. If backfill soils have dried out, they should be thoroughly moisture conditioned prior to placement in trenches.

6.2.9 Shrinkage and Bulking

Several factors will impact earthwork balancing on the site, including shrinkage, subsidence, trench spoil from utilities and footing excavations, as well as the accuracy of topography.

Shrinkage is primarily dependent upon the degree of compactive effort achieved during construction. For planning purposes, a shrinkage factor of 5 to 10 percent may be considered for the alluvium. Bedrock materials may bulk up to 10 percent or possibly more. Site balance areas should be available in order to adjust project grades, depending on actual field conditions at the conclusion of site earthwork construction.

Due to the presence of relatively shallow bedrock across the site, subsidence is expected to be negligible.

6.3 DESIGN RECOMMENDATIONS

6.3.1 Foundation Design Criteria

Foundation design criteria for a conventional foundation system, in general conformance with the 2019 CBC, are presented herein. These are typical design criteria and are not intended to supersede the design by the structural engineer.

Based on the results of laboratory testing (GeoTek and Earth Strata, 2015a), the on-site materials are classified as having "very low" (0≤EI≤20) to "low" (21≤EI≤50) expansion potential per ASTM D 4829. Additional laboratory testing should be performed at the completion of site grading to verify the expansion potential of the near-surface soils.

The foundation elements for the proposed structures should bear entirely in engineered fill soils as recommended in this report. Foundations should be designed in accordance with the *2019 California Building Code* (CBC). A summary of the foundation design recommendations is presented in the following table:

MINIMUM DESIGN REQUIREMENTS FOR CONVENTIONALLY REINFORCED FOUNDATIONS		
Design Parameter	"Very Low" Expansion Potential (0≤EI≤20)	"Low" Expansion Potential (21≤EI≤50)
Foundation Depth or Minimum Perimeter Beam Depth (inches below lowest adjacent grade)	One- and two-story – 12	One- and two-story - 12
Minimum Foundation Width (Inches)*	One-and two-story – 12	One- and two-story – 15
Minimum Slab Thickness (Inches)	4 - Actual	4 - Actual
Minimum Slab Reinforcing	6" x 6" – W1.4/W1.4 welded wire fabric placed in middle of slab	6" x 6" – W2.9/W2.9 welded wire fabric or No. 3 reinforcing bars placed at 18 o.c. each way placed in middle of slab
Minimum Reinforcement for Continuous Footings, Grade Beams, and Retailing Wall Footings	Two No. 4 reinforcing bars, one placed near the top and one near the bottom	Two No. 4 reinforcing bars, one placed near the top and one near the bottom
Effective Plasticity Index**	0 – design value	35 – design value
Presaturation of Subgrade Soil (Percent of Optimum/Depth in Inches)	Minimum 100% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete	Minimum of 110% of the optimum moisture content to a depth of at least 12 inches prior to placing concrete

*Code minimums per Table 1809.7 of the 2016 CBC
**Effective plasticity index should be verified at the completion of remedial grading

It should be noted that the criteria provided are based on soil support characteristics only. The structural engineer should design the slab and beam reinforcement based on actual loading conditions.

An allowable bearing capacity of 2,000 pounds per square foot (psf) may be used for design of continuous and perimeter footings 12 inches deep and 12 inches wide, and pad footings 24 inches square and 12 inches deep. This value may be increased by 300 psf for each additional 12 inches in depth and by 300 psf for each additional 12 inches in width to a maximum value of 3,500 psf. Additionally, an increase of one-third may be applied when considering short-term live loads (e.g., seismic and wind loads).

The recommended allowable bearing capacity is based on an estimated maximum post-construction settlement of 1-inch. Differential settlement of about one-half of the total settlement over a horizontal distance of 40 feet could result. Seismically induced settlement is expected to be negligible. The project structural engineer, foundation engineer, and earth retention structure designer should incorporate these settlement estimates into the design, as appropriate.

The passive earth pressure may be computed as an equivalent fluid having a density of 300 psf per foot of depth, to a maximum earth pressure of 3,500 psf for footings founded on engineered fill. A coefficient of friction between soil and concrete of 0.35 may be used with dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

A grade beam, a minimum of 12 inches wide and 12 inches deep, should be utilized across large entrances. The base of the grade beam should be at the same elevation as the bottom of the adjoining footings.

A moisture and vapor retarding system should be placed below slabs-on-grade where moisture migration through the slab is undesirable. Guidelines for these are provided in the 2019 California Green Building Standards Code (CALGreen) Section 4.505.2, the 2019 CBC Section 1907.1 and ACI 360R-10. The vapor retarder design and construction should also meet the requirements of ASTM E 1643. A portion of the vapor retarder design should be the implementation of a moisture vapor retardant membrane.

It should be realized that the effectiveness of the vapor retarding membrane can be adversely impacted as the result of construction related punctures (e.g., stake penetrations, tears, punctures from walking on the aggregate layer, etc.). These occurrences should be limited as

much as possible during construction. Thicker membranes are generally more resistant to accidental puncture than thinner ones. Products specifically designed for use as moisture/vapor retarders may also be more puncture resistant. It is GeoTek's opinion that a minimum ten mil thick membrane with joints properly overlapped and sealed should be considered, unless otherwise specified by the slab design professional. Moisture and vapor retarding systems are intended to provide a certain level of resistance to vapor and moisture transmission through the concrete, but do not eliminate it. The acceptable level of moisture transmission through the slab is to a large extent based on the type of flooring used and atmospheric conditions.

Ultimately, the vapor retarding system should be comprised of suitable elements to limit migration of water and reduce transmission of water vapor through the slab to acceptable levels. The selected elements should have suitable properties (i.e., thickness, composition, strength, and permeance) to achieve the desired performance level. Consideration should be given to consulting with an individual possessing specific expertise in this area for additional evaluation.

It is recommended that control joints be placed in two directions spaced approximately 24 to 36 times the thickness of the slab in inches. These joints are a widely accepted means to control cracks and should be reviewed by the project structural engineer.

6.3.2 Miscellaneous Foundation Recommendations

To minimize moisture penetration beneath the slab-on-grade areas, utility trenches should be backfilled with engineered fill, lean concrete, or concrete slurry where they intercept the perimeter footing or thickened slab edge.

Soils from the footing excavations should not be placed in the slab-on-grade areas unless properly compacted and tested. The excavations should be free of loose/sloughed materials and be neatly trimmed at the time of concrete placement.

6.3.3 Foundation Setbacks

Where applicable, the following setbacks should apply to all foundations. Any improvements not conforming to these setbacks may be subject to lateral movements and/or differential settlements:

- The outside bottom edge of all footings should be set back a minimum of H/3 (where H is the slope height) from the face of any descending slope. The setback should be at least 5 feet and need not exceed 40 feet.

- The outside bottom edge of all footings should be set back a minimum of H/2 (where H is the slope height) from the face of any ascending slope. The setback should be at least 7 feet and need not to exceed 15 feet. Where a retaining wall is constructed at the toe of the slope, the height of the slope should be measured from top of the wall to the top of the slope.
- The bottom of all footings for structures near retaining walls should be deepened so as to extend below a 1:1 (h:v) projection upward from the bottom inside edge of the wall footing.
- The bottom of any proposed foundations for structures should be deepened so as to extend below a 1:1 (h:v) projection upward from the bottom of the nearest excavation.

6.4 RETAINING WALL DESIGN AND SITE CONSTRUCTION

6.4.1 General Design Criteria

Recommendations presented herein may apply to typical masonry or concrete vertical walls retaining up to six feet of soil. Additional review and recommendations should be requested for higher walls.

Retaining wall foundations embedded a minimum of 12 inches below the lowest adjacent grade and should rest on at least 24 inches of compacted fill. Wall footings should be designed using an allowable bearing capacity of 2,000 psf. An increase of one-third may be applied when considering short-term live loads (e.g., seismic and wind loads). The passive earth pressure may be computed as an equivalent fluid having a density of 300 psf per foot of depth, to a maximum earth pressure of 3,500 psf. A coefficient of friction between soil and concrete of 0.35 may be used with dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

An equivalent fluid pressure approach may be used to compute the horizontal active pressure against the wall. The appropriate fluid unit weights are given in the table below for specific slope gradients of retained materials.

ACTIVE EARTH PRESSURES	
Surface Slope of Retained Materials (H:V)	Equivalent Fluid Pressure (PCF) Native Materials*
Level	42
2:1	65

*The design pressures assume the native backfill material has an expansion index less than or equal to 20. Backfill zone includes area between the back of the wall and footing to a plane (1:1 h:v) up from the bottom of the wall foundation to the ground surface.

The above equivalent fluid weights do not include superimposed loading conditions such as expansive soils, vehicular traffic, structures, seismic conditions or adverse geologic conditions.

For walls with more than 6 feet of compacted backfill, a seismic force must also be included into the wall design. For proposed earth retention structures an earthquake-induced equivalent fluid pressure of 15 pcf should be included into the wall design. This earthquake pressure was determined using the Seed and Whitman method. This seismic pressure can be assumed to be a conventional triangular distribution.

6.4.2 Restrained Retaining Walls

Any retaining wall that will be restrained prior to placing backfill or walls that have male or reentrant corners should be designed for at-rest soil conditions using an equivalent fluid pressure of 65 pcf, plus any applicable surcharge loading. For areas having male or reentrant corners, the restrained wall design should extend a minimum distance equal to twice the height of the wall laterally from the corner, or as otherwise determined by the structural engineer.

6.4.3 Wall Backfill and Drainage

Retaining wall backfill should be free of deleterious and/or oversized materials and should have and expansion index of less than 20. Retaining walls should be provided with an adequate pipe and gravel back drain system to help prevent buildup of hydrostatic pressures. Backdrains should consist of a four-inch diameter perforated collector pipe (Schedule 40, SDR 35, or approved equivalent) embedded in a minimum of one-cubic foot per linear foot of ¾□to 1-inch clean crushed rock or an approved equivalent, wrapped in filter fabric (Mirafi 140N or an approved equivalent). The drain system should be connected to a suitable outlet. Waterproofing of site walls should be performed where moisture migration through the wall is undesirable.

Retaining wall backfill should be placed in lifts no greater than eight inches in thickness and compacted to a minimum of 90 percent relative compaction as determined by ASTM D 1557 test procedures. The wall backfill should also include a minimum one-foot wide section of ¾- to 1-inch clean crushed rock (or an approved equivalent). The rock should be placed immediately adjacent to the back of the wall and extend up from a back drain to within approximately 24 inches of the finish grade. The rock should be separated from the earth with filter fabric. The upper 24 inches should consist of compacted on-site soil.

As an alternative to the drain rock and fabric, Miradrain 2000, or approved equivalent, may be used behind the retaining wall. The Miradrain 2000 should extend from the base of the wall to within two feet of the ground surface. The subdrain should be placed at the base of the wall in direct contact with the Miradrain 2000.

The presence of other materials might necessitate revision to the parameters provided and modification of the wall designs. Proper surface drainage needs to be provided and maintained. Walls from two to four feet in height may be drained using localized gravel packs behind weep holes at eight feet maximum spacing (e.g., approximately 1.5 cubic feet of gravel in a woven plastic bag). Weep holes should be provided or the head joints omitted in the first course of block extended above the ground surface. However, nuisance water may still collect in front of the wall.

Drain outlets should be maintained over the life of the project and should not be obstructed or plugged by adjacent improvements.

6.4.3.1 Other Design Considerations

- Wall design should consider the additional surcharge loads from superjacent slopes and/or footings, where appropriate.
- No backfill should be placed against concrete until minimum design strengths are evident by compression tests of cylinders.
- The retaining wall footing excavations, backcuts, and backfill materials should be approved by the project geotechnical engineer or their authorized representative.
- Positive separations should be provided in garden walls at horizontal distances not exceeding 20 feet.

6.4.4 Pavement Design Considerations

No on-site earth material has been tested to determine a preliminary R-Value for pavement design. A R-Value of 40 is assumed for the determination of preliminary pavement sections for

this report. The final design should be based on R-Value testing of the soil subgrade following completion of rough grading operations. Project streets should be designed in accordance with County of Riverside requirements when final Traffic Indices and R-Value test results of the subgrade soil are completed.

Pavement design for proposed on-site and off-site street improvements was conducted per Caltrans *Highway Design Manual* guidelines for flexible pavements. Based on traffic indices (TIs) generally associated with this type of project and using a design R-value of 40, the following preliminary sections were calculated:

PRELIMINARY PAVEMENT SECTIONS			
TI	R-Value	Thickness of Asphalt Concrete (inches)	Thickness of Aggregate Base (inches)
5.5 (Access Road and Local Street)	40	3*	6
6.5 (Enhanced Local Street at School or Park)		4*	6*
7.0 (Collector)		4*	8
8.5 (Secondary Highway)		5*	9
9.0 (Major Highway)		5*	10

*Minimum pavement structural section per County of Riverside Standards

The TIs used in the above pavement analysis and design were designated by Riverside County for the indicated street types and should provide a pavement life of approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving may result in premature pavement failure. Traffic parameters used for design were selected based upon engineering judgment and not upon information furnished to us such as an equivalent wheel load analysis or a traffic study.

The recommended pavement sections provided are intended as a minimum guideline and final selection of pavement cross section parameters should be made by the project civil engineer, based upon the local laws and ordinates, expected subgrade and pavement response, and desired level of conservatism. If thinner or highly variable pavement sections are constructed, increased maintenance and repair could be expected. Final pavement design should be checked by testing of soils exposed at subgrade (the upper 12 inches) after final grading has been completed.

Asphalt concrete and aggregate base should conform to current Caltrans Standard Specifications Section 39 and 26-1.02, respectively. As an alternative, asphalt concrete can conform to Section 203-6 of the current Standard Specifications for Public Work (Green Book). Crushed aggregate base or crushed miscellaneous base can conform to Section 200-2.2 and 200-2.4 of the Green Book, respectively. Pavement base should be compacted to at least 95 percent of the ASTM D1557 laboratory maximum dry density (modified proctor).

All pavement installation, including preparation and compaction of subgrade, compaction of base material, placement and rolling of asphaltic concrete, should be done in accordance with County of Riverside specifications, and under the observation and testing of GeoTek and a County Inspector where required. Jurisdictional minimum compaction requirements in excess of the aforementioned minimums may govern.

Deleterious material, excessive wet or dry pockets, oversized rock fragments, and other unsuitable yielding materials encountered during grading should be removed. Once existing compacted fill are brought to the proposed pavement subgrade elevations, the subgrade should be proof rolled in order to check for a uniform and unyielding surface. The upper 12 inches of pavement subgrade soils should be scarified, moisture conditioned at or near optimum moisture content, and recompacted to at least 95 percent of the laboratory maximum dry density as determined by ASTM D1557 test procedures. If loose or yielding materials are encountered during construction, additional evaluation of these areas should be carried out by GeoTek. All pavement section changes should be properly transitioned.

6.4.5 Soil Corrosivity

The soil resistivity at this site was tested in the laboratory on two samples collected during the field investigation. The results of the testing indicate that the on-site soils are considered "extremely corrosive" (804 ohm-cm) (Roberge, 2000) to buried ferrous metal in accordance with current standards used by corrosion engineers. It is recommended that a corrosion engineer be consulted to provide recommendations for the protection of buried ferrous metal at this site.

6.4.6 Soil Sulfate Content

The sulfate content was determined in the laboratory on two samples collected during the field investigation. The results indicate that the water-soluble sulfate results are less than 0.1 percent by weight, which is considered "negligible" as per ACI 318. Based on the test results and Table 4.3.1 of ACI 318, no special recommendations for concrete are required for this project due to soil sulfate exposure.

Additional soil sampling, laboratory testing and analysis regarding soil corrosion and soil sulfate content should be conducted following completion of the project rough grading operation.

6.4.7 Import Soils

Import soils should have expansion characteristics similar to the on-site soils. GeoTek also recommends that the proposed import soils be tested for expansion and sulfate potential. GeoTek should be notified a minimum of 72 hours prior to importing so that appropriate sampling and laboratory testing can be performed.

6.4.8 Concrete Flatwork

6.4.8.1 Exterior Concrete Slabs, Sidewalks, and Driveways

Exterior concrete slabs, sidewalks and driveways should be designed using a four-inch minimum thickness. No specific reinforcement is required from a geotechnical perspective. However, some shrinkage and cracking of the concrete should be anticipated as a result of typical mix designs and curing practices commonly utilized in industrial construction.

Sidewalks and driveways may be under the jurisdiction of the governing agency. If so, jurisdictional design and construction criteria would apply, if more restrictive than the recommendations presented in this report.

Subgrade soils should be pre-moistened prior to placing concrete. The subgrade soils below exterior flatwork with "very low" expansive soils should be pre-saturated to a minimum of 100 percent of optimum moisture content or 110 percent of optimum moisture for "low" expansive soils to a depth of at least 12 inches.

All concrete installation, including preparation and compaction of subgrade, should be done in accordance with the County of Riverside specifications, and under the observation and testing of GeoTek and a County inspector, if necessary.

6.4.8.2 Concrete Performance

Concrete cracks should be expected. These cracks can vary from sizes that are hairline to more than 1/8 inch in width. Most cracks in concrete, while unsightly, do not significantly impact long-term performance. While it is possible to take measures (proper concrete mix, placement, curing, control joints, etc.) to reduce the extent and size of cracks that occur, some cracking will occur despite the best efforts to minimize it. Concrete can also undergo chemical processes that are dependent upon a wide range of variables, which are difficult, at best, to control. Concrete, while seemingly a stable material, is subject to internal expansion and contraction due to external changes over time.

One of the simplest means to control cracking is to provide weakened control joints for cracking to occur along. These do not prevent cracks from developing; they simply provide a relief point for the stresses that develop. These joints are a widely accepted means to control cracks but are not always effective. Control joints are more effective the more closely spaced they are. GeoTek suggests that control joints be placed in two orthogonal directions and located a distance apart approximately equal to 24 to 36 times the slab thickness.

6.5 POST CONSTRUCTION CONSIDERATIONS

6.5.1 Landscape Maintenance and Planting

Water has been shown to weaken the inherent strength of soil, and slope stability is significantly reduced by overly wet conditions. Positive surface drainage away from graded slopes should be maintained and only the amount of irrigation necessary to sustain plant life should be provided for planted slopes. Controlling surface drainage and runoff and maintaining a suitable vegetation cover can minimize erosion. Plants selected for landscaping should be lightweight, deep-rooted types that require little water and are capable of surviving the prevailing climate.

Overwatering should be avoided. Care should be taken when adding soil amendments to avoid excessive watering. Leaching as a method of soil preparation prior to planting is not recommended. An abatement program to control ground-burrowing rodents should be implemented and maintained. This is critical as burrowing rodents can decreased the long-term performance of slopes.

It is common for planting to be placed adjacent to structures in planter or lawn areas. This will result in the introduction of water into the ground adjacent to the foundations. This type of

landscaping should be avoided. Due to the presence of high expansive soils, irrigation should be minimized adjacent to the buildings. Planters within 30 feet of the buildings should be above ground and underlain by a concrete slab. Waterproofing of the foundation and/or subdrains may be warranted and advisable. We could discuss these issues, if desired, when plans are made available.

6.5.2 Drainage

The need to maintain proper surface drainage and subsurface systems cannot be overly emphasized. Positive site drainage should be maintained at all times, as directed by the project civil engineer. Drainage should not flow uncontrolled down any descending slope. Water should be directed away from foundations and not allowed to pond or seep into the ground adjacent to the footings and floor-slabs. Pad drainage should be directed toward approved areas and not be blocked by other improvements.

Roof gutters should be installed that will direct the collected water at least 20 feet from the buildings.

It is the owner's responsibility to maintain and clean drainage devices on or contiguous to their lot. In order to be effective, maintenance should be conducted on a regular and routine schedule and necessary corrections made prior to each rainy season.

6.6 PLAN REVIEW AND CONSTRUCTION OBSERVATIONS

It is recommended that site grading, specifications, retaining wall/shoring plans and foundation plans be reviewed by this office prior to construction to check for conformance with the recommendations contained in this report. Additional recommendations may be necessary based on these reviews. It is also recommended that GeoTek representatives be present during site grading and foundation construction to check for proper implementation of the geotechnical recommendations. The owner/developer should have GeoTek's representative perform at least the following duties:

- Observe site clearing and grubbing operations for proper removal of unsuitable materials.
- Observe and test bottom of removals prior to fill placement.
- Evaluate the suitability of on-site and import materials for fill placement and collect soil samples for laboratory testing when necessary.
- Observe the fill for uniformity during placement including utility trenches.

- Test the fill for field density and relative compaction.
- Test the near-surface soils to verify proper moisture content.
- Observe and probe foundation excavations to confirm suitability of bearing materials.

If requested, a construction observation and compaction report can be provided by GeoTek, which can comply with the requirements of the governmental agencies having jurisdiction over the project. It is recommended that these agencies be notified prior to commencement of construction so that necessary grading permits can be obtained.

7. LIMITATIONS

This evaluation does not and should in no way be construed to encompass any areas beyond the specific area of proposed construction as indicated to us by the client. Further, no evaluation of any existing site improvements is included. The scope of this report is based on GeoTek's understanding of the project and the client's needs, GeoTek's proposal (Proposal No. P-0705721-CR) dated July 21, 2021 and geotechnical engineering standards normally used on similar projects in this region.

The materials observed on the project site appear to be representative of the area; however, soil and bedrock materials vary in character between excavations and natural outcrops or conditions exposed during site construction. Site conditions may vary due to seasonal changes or other factors. GeoTek, Inc. assumes no responsibility or liability for work, testing or recommendations performed or provided by others.

Since the recommendations contained in this report are based on the site conditions observed and encountered, and laboratory testing, GeoTek's conclusions and recommendations are professional opinions that are limited to the extent of the available data. Observations during construction are important to allow for any change in recommendations found to be warranted. These opinions have been derived in accordance with current standards of practice and no warranty is expressed or implied. Standards of practice are subject to change with time.

8. SELECTED REFERENCES

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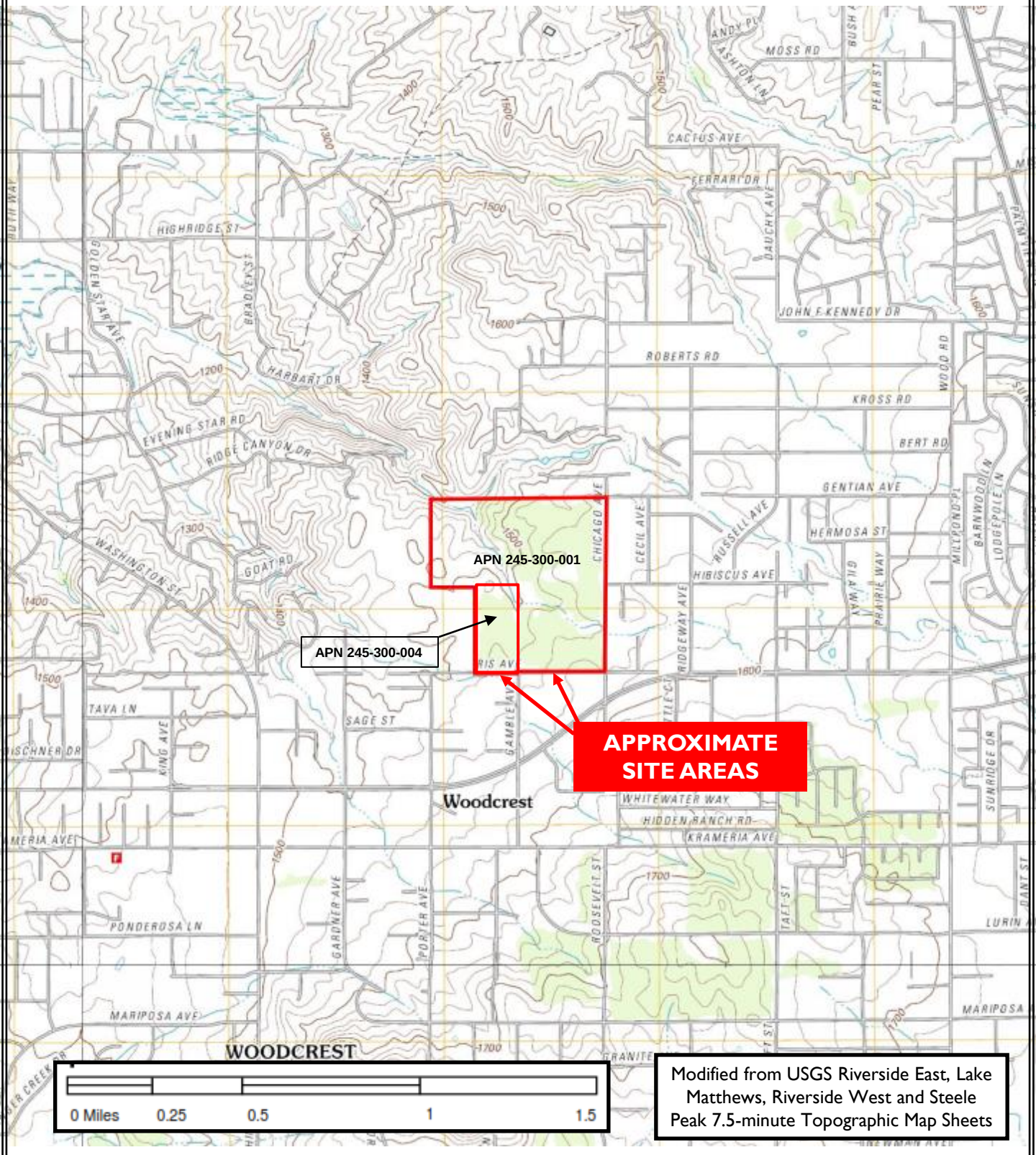


Modified from USGS Riverside East, Lake Matthews, Riverside West and Steele Peak 7.5-minute Topographic Map Sheets

TTLC Management an Arizona Corp.
Assessor's Parcel Numbers 245-300-001 and -004
Woodcrest Area of Riverside County, California

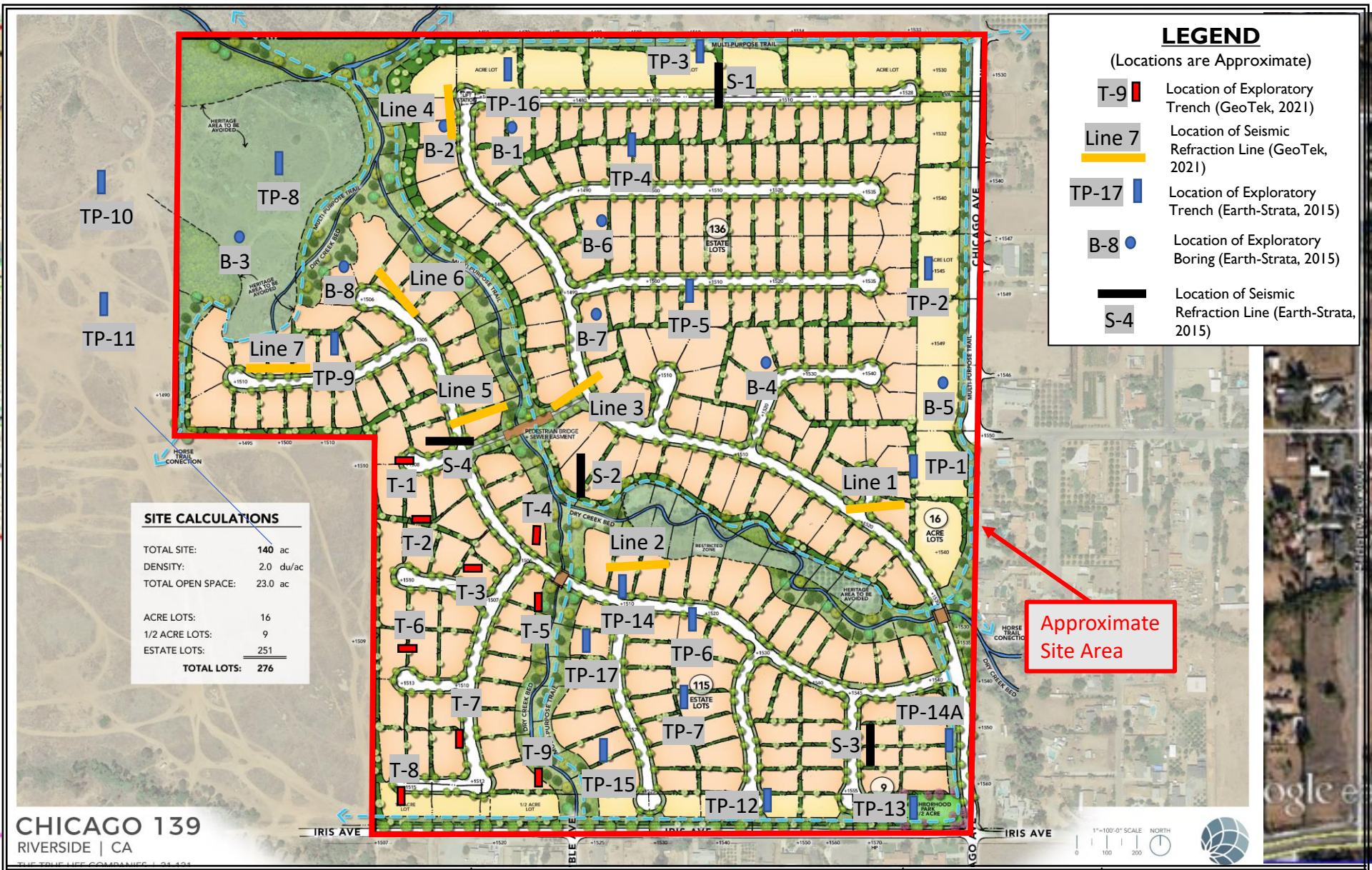
Project No. 2855-CR

NORTH

Figure 1

Site Location Map

GEOTEK



TTLC Management an Arizona Corp.
Proposed Single-Family Residential Development
NW of Iris Avenue and Chicago Avenue
Woodcrest Area of Riverside County, California

GeoTek Project No. 2855-CR

Figure 2

Exploration Location Map

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APPENDIX A

EXPLORATION LOGS, LABORATORY TEST RESULTS AND SEISMIC REFRACTION SURVEY DATA BY EARTH-STRATA (2015a)

Updated Geotechnical Evaluation
Proposed Single-Family Residential Development
Woodcrest, Riverside County, California
Project No. 2855-CR

GEOTEK

Geotechnical Boring Log B-1

Date: March 25, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; light orange brown, dry to slightly moist, medium dense
	70	1	105.1	10.3		**Cretaceous Val Verde Tonalite (Kvt)**
					SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5	50/4"	2	81.4	19.6	SC	Clayey SAND; light grey, moist, grainitic bedrock
						Dark grey, moist, coarse, very hard
10						End of Boring at 10 feet
						No Groundwater
15						
20						
25						
30						

Geotechnical Boring Log B-2

Date: March 25, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SC	Clayey SAND; reddish brown, dry
						Cretaceous Val Verde Tonalite (Kvt)
	68	1	118.6	8.9	SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5	50/8"	2	91.6	4.6		
10						End of Boring at 10 feet
						No Groundwater
15						
20						
25						
30						

Geotechnical Boring Log B-3

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; light brown, dense
						Cretaceous Val Verde Tonalite (Kvt)
5					SC	Clayey Sandstone; light tan brown, moist, hard to very hard
						End of Boring at 5.5 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log B-4

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; light brown, dense
	88/10"	1				**Cretaceous Val Verde Tonalite (Kvt)**
					SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5						
10						End of Boring at 10 feet
						No Groundwater
15						
20						
25						
30						

Geotechnical Boring Log B-5

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; light brown, dense
						Cretaceous Val Verde Tonalite (Kvt)
	96/8"	1			SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5						
						End of Boring at 7.5
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log B-6

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					ML	Sandy SILT; light brown, dense
						Cretaceous Val Verde Tonalite (Kvt)
	110/3"	1			SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5						
	50/1"	2				
						End of Boring at 6 feet
						No Groundwater
10						
15						
20						
25						
30						

Geotechnical Boring Log B-7

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: GWG**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; light brown, dense
						Cretaceous Val Verde Tonalite (Kvt)
	50/4"	1			SM	Silty SAND (weathered bedrock);
5						
10						End of Boring at 10 feet
						No Groundwater
15						
20						
25						
30						

Geotechnical Boring Log B-8

Date: March 31, 2015	**Project Name: P& F Prpoerty** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: DV**
Drilling Company: Drilling It	**Type of Rig: CME 45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
						Sandy SILT; reddish brown, dense
						Cretaceous Val Verde Tonalite (Kvt)
	50/2"	1			SC	Clayey Sandstone; light tan brown, moist, hard to very hard
5						
						End of Boring at 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-1

Date: March 27, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, slightly moist, with weathered rock
						Tonalite (Kvt):
5					SP	Sand with SILT and weathered rock, gravel size; grey and light brown
						End of Boring at 6 feet
						No Groundwater
						`
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-2

Date: March 28, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, medium dense
						Tonalite (Kvt):
					SP	SAND with fine GRAVEL (weathered rock); light grey
5						End of Boring at 4.9 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-3

Date: March 28, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil**
					SM	Silty SAND; reddish brown, dry, medium dense
						Tonalite (Kvt):
					SP	Sand with fine GRAVEL; light grey, dry, weatherd bedrock
						End of Boring at 4 feet
5						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-4

Date: March 28, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, medium dense
5						**Tonalite (Kvt):**
					SP	SAND with SILT; reddish brown, dry, medium dense
						End of Boring at 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-5

Date: March 27, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose to medium dense
						Tonalite (Kvt):
					SP	SAND (weathered bedrock); light grey with black spots, very dense
5						End of Boring at 4.7 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-6

Date: March 27, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
					SP	SAND (weathered bedrock); light grey, dry, very dense
5						End of Boring 5 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-7

Date: March 27, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Mini Excavator**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brown, dry, medium dense
						Tonalite (Kvt):
					SP	SAND (weathered bedrock) with gravel; light grey, very dense
						End of Boring at 2.5 feet
5						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-8

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; Reddish brown, dry, loose
5						**Tonalite (Kvt):**
					SP	SAND (weathered bedrock); light grey, dry, very dense
						End of Boring at 5.1 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-9

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
5						**Tonalite (Kvt):**
					SP	SAND (weathered bedrock); light grey, hard, dry, very dense
						End of Boring at 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-10

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
5					SP	SAND (wethered bedrock); light grey, hard, dry, very dense
						End of Boring at 5 feet
						No Groundwater
10						
15						
20						
25						
30						

Geotechnical Boring Log TP-11

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
					SP	SAND (wethered bedrock); light grey, hard, dry, very dense
						End of Boring at 2.1 feet
5						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-12

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, loose, moist
						Tonalite (Kvt):
5					SP	SAND (weathered bedrock); light grey, moist, very dense
						End of Boring at 5 feet
						No Groundwater
10						
15						
20						
25						
30						

Geotechnical Boring Log TP-13

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
					SP	SAND (weathered bedrock); light grey, moist, very dense
						End of Boring at 3.8 feet
5						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-14A

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; brown, dry, hard, medium-dense
					SP	**Tonalite (Kvt):**
						SAND (weathered bedrock); brown, dry, very dense
5						End of Boring at 3 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-14

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
5					SP	SAND (weathered bedrock); light grey, hard, dry, very dense
						End of Boring at 6 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-15

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
					SP	SAND (weathered bedrock); light grey, hard, dry, very dense
5						End of Boring at 5 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-16

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
						Tonalite (Kvt):
5					SP	SAND (weathered bedrock); light grey, hard, dry, very dense
						End of Boring at 3.2 feet
						No Groundwater
10						
15						
20						
25						
30						

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Geotechnical Boring Log TP-17

Date: April 7, 2015	**Project Name: P & F Properties** **Page: 1 of 1**
Project Number: 15735-10A	**Logged By: SMP**
Drilling Company: Drilling It	**Type of Rig: Backhoe**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft):	**Hole Location: See Geotechnical Map**

Depth (ft)	Blow Count Per Foot	Sample Number	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**Topsoil:**
					SM	Silty SAND; reddish brown, dry, loose
5						**Tonalite (Kvt):**
					SP	SAND (weathered bedrock); light grey, hard, dry, very dense
						End of Boring at 5.2 feet
						No Groundwater
10						
15						
20						
25						
30						

APPENDIX C

LABORATORY PROCEDURES AND TEST RESULTS

APPENDIX C

Laboratory Procedures and Test Results

Laboratory testing provided quantitative and qualitative data involving the relevant engineering properties of the representative earth materials selected for testing. The representative samples were tested in general accordance with American Society for Testing and Materials (ASTM) procedures and/or California Test Methods (CTM).

Soil Classification: Earth materials encountered during exploration were classified and logged in general accordance with the Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) of ASTM D 2488. Upon completion of laboratory testing, exploratory logs and sample descriptions were reconciled to reflect laboratory test results with regard to ASTM D 2487.

Moisture and Density Tests: For select samples moisture content was determined using the guidelines of ASTM D 2216 and dry density determinations were made using the guidelines of ASTM D 2937. These tests were performed on relatively undisturbed samples and the test results are presented on the exploratory logs.

Maximum Density Tests: The maximum dry density and optimum moisture content of representative samples were determined using the guidelines of ASTM D 1557. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	MAXIMUM DRY DENSITY (pcf)	OPTIMUM MOISTURE CONTENT (%)
B-1 @ 0 to 2 feet	Olive Brown SAND with SILT	133.0	7.5
B-2 @ 0 to 2 feet	Dark Yellowish Brown Silty SAND with trace CLAY	127.0	8.0
TP-1 @ 0 to 3 feet	Dark Brown Silty SAND	125.0	11.5
TP-1 @ 4 to 5 feet	Olive Brown Silty SAND	108.5	10.0

Expansion Index: The expansion potential of representative samples was evaluated using the guidelines of ASTM D 4829. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	EXPANSION INDEX	EXPANSION POTENTIAL
B-1 @ 0 to 2 feet	Olive Brown SAND with SILT	0	Very Low
B-2 @ 0to 2 feet	Dark Yellowish Brown Silty SAND with trace CLAY	7	Very Low
TP-1 @ 0 to 3 feet	Dark Brown Silty SAND	29	Low
TP-1 @ 4 to 5 feet	Olive Brown Silty SAND	7	Very Low

Minimum Resistivity and pH Tests: Minimum resistivity and pH Tests of select samples were performed using the guidelines of CTM 643. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	pH	MINIMUM RESISTIVITY (ohm-cm)
B-1 @ 0 to 2 feet	Olive Brown SAND with SILT	7.3	1,000
B-2 @ 0 to 2 feet	Dark Yellowish Brown Silty SAND with trace CLAY	7.1	440
TP-1 @ 0 to 3 feet	Dark Brown Silty SAND	7.2	400
TP-1 @ 4 to 5 feet	Olive Brown Silty SAND	7.8	1,100

Soluble Sulfate: The soluble sulfate content of select samples was determined using the guidelines of CTM 417. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	SULFATE CONTENT (% by weight)	SULFATE EXPOSURE
B-1 @ 0 to 2 feet	Olive Brown SAND with SILT	0.002	Negigible
B-2 @ 0 to 2 feet	Dark Yellowish Brown Silty SAND with trace CLAY	0.029	Negigible
TP-1 @ 0 to 3	Dark Brown Silty SAND	0.002	Negigible
TP-1 @ 4 to 5 feet	Olive Brown Silty SAND	0.002	Negigible

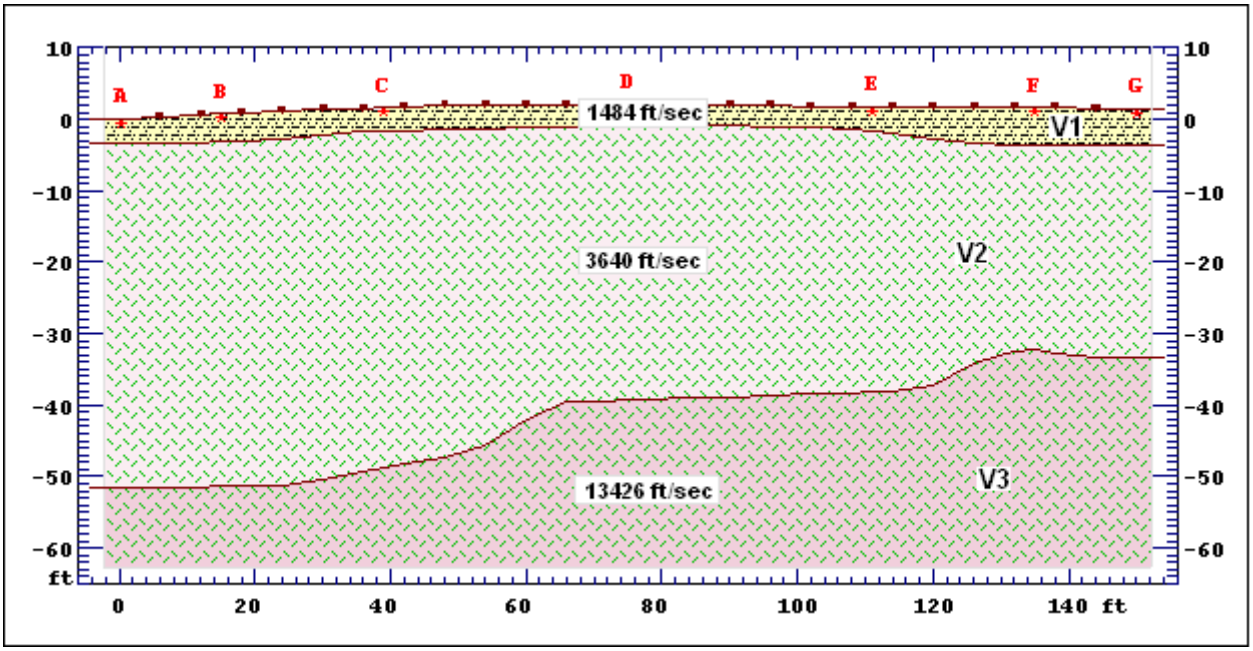
Chloride Content: Chloride content of select samples was determined using the guidelines of CTM 422. The test results are presented in the table below.

SAMPLE LOCATION	MATERIAL DESCRIPTION	CHLORIDE CONTENT (ppm)
B-1 @ 0 to 2 feet	Olive Brown SAND with SILT	50
B-2 @ 0 to 2 feet	Dark Yellowish Brown Silty SAND with trace CLAY	70
TP-1 @ 0 to 3 feet	Dark Brown Silty SAND	60
TP-1 @ 4 to 5 feet	Olive Brown Silty SAND	20

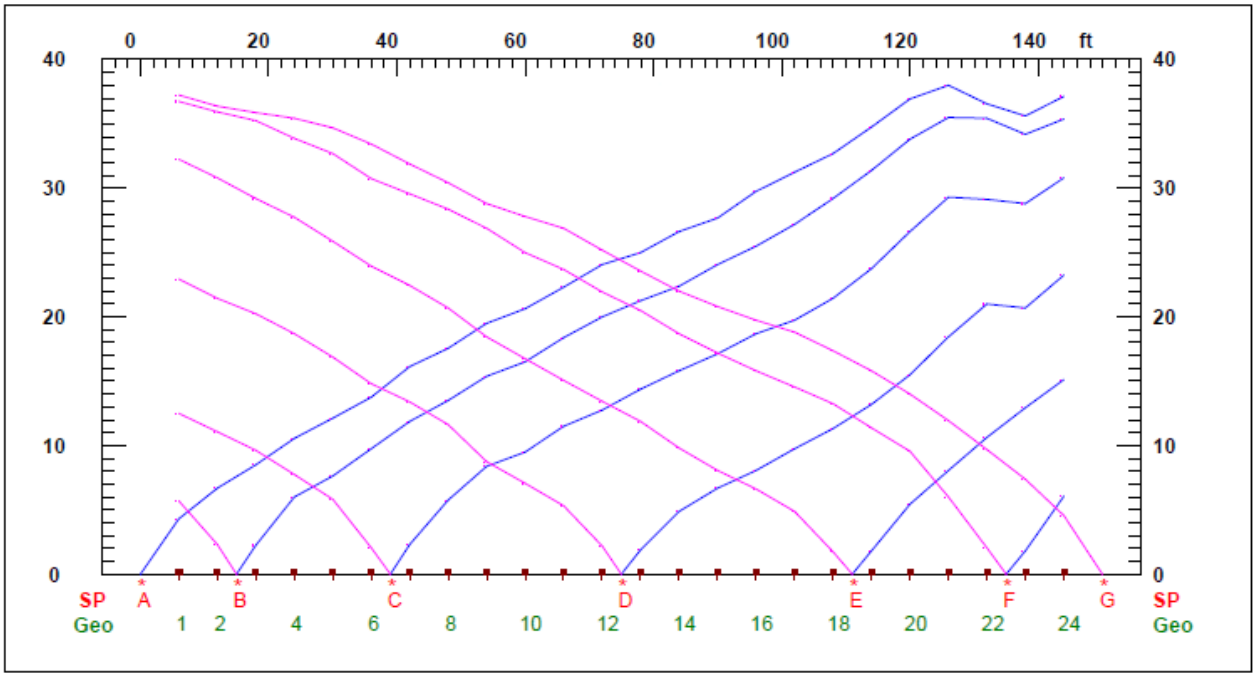
SEISMIC LINE S-1

< South - North >

LAYER VELOCITY MODEL



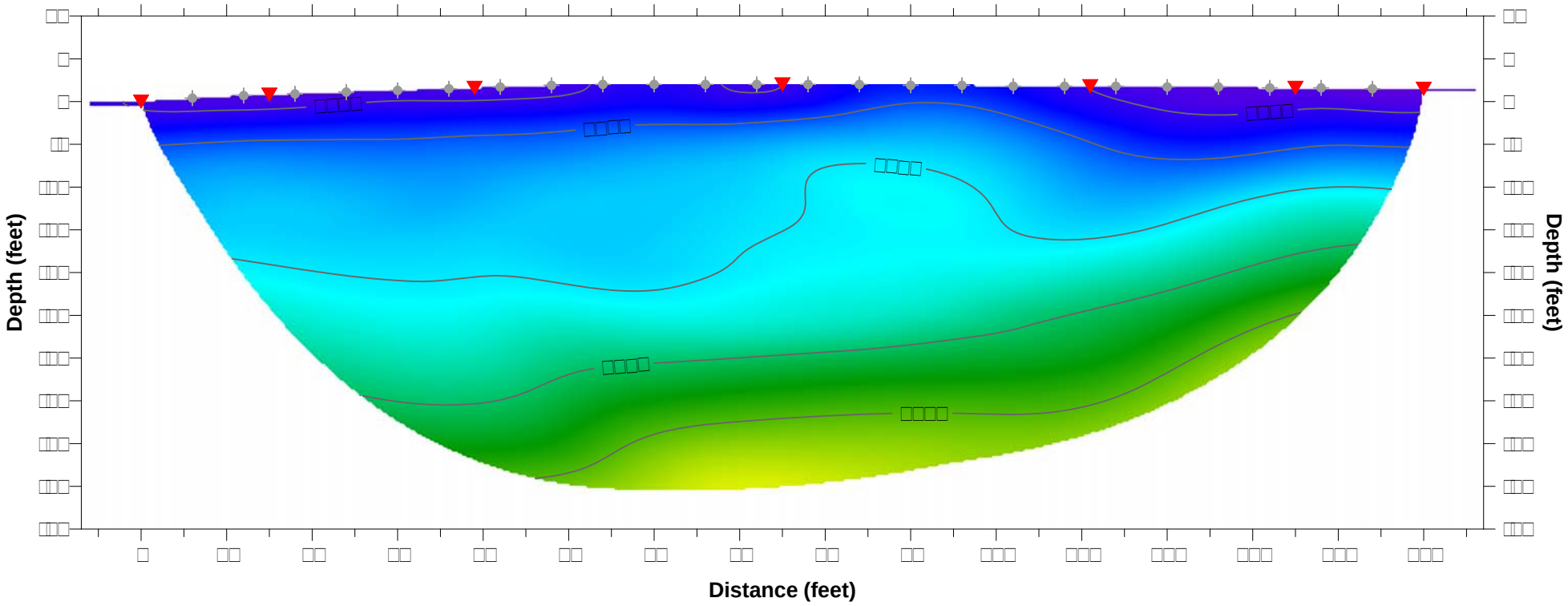
TIME-DISTANCE PLOT



SEISMIC LINE S-1

← South - North →

REFRACTION TOMOGRAPHIC MODEL



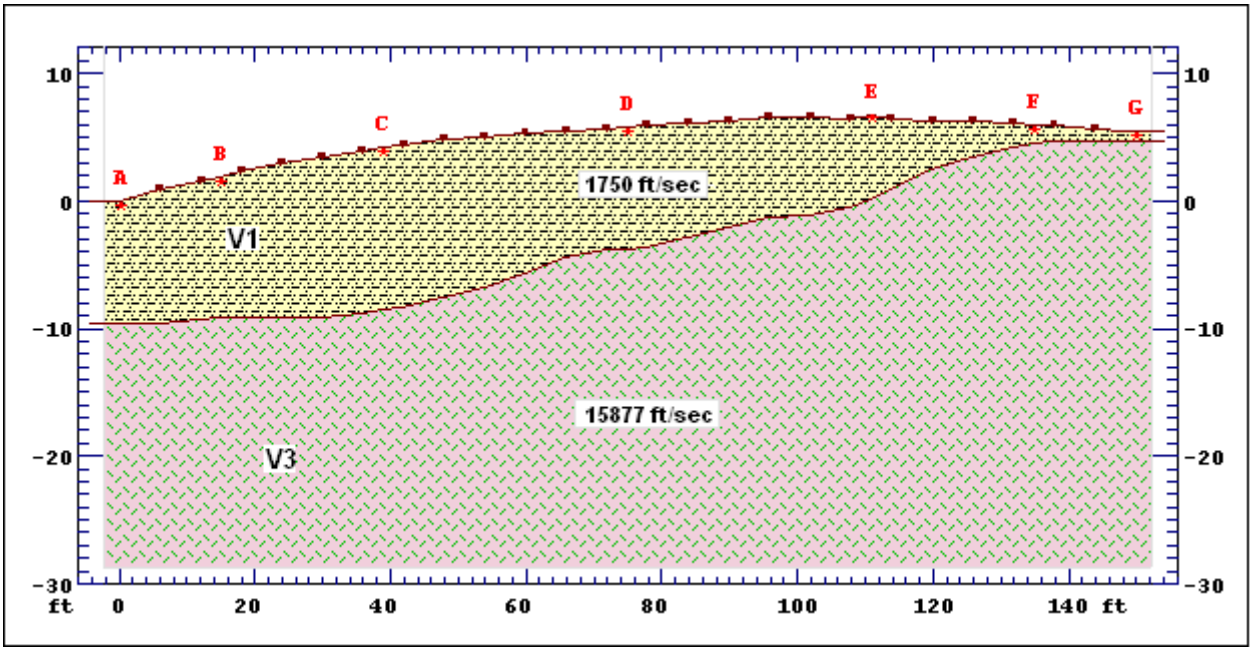
SCALE: 1" = 18' (Horizontal & Vertical)

RMS error 1.4 %, Rayfract Version 3.33

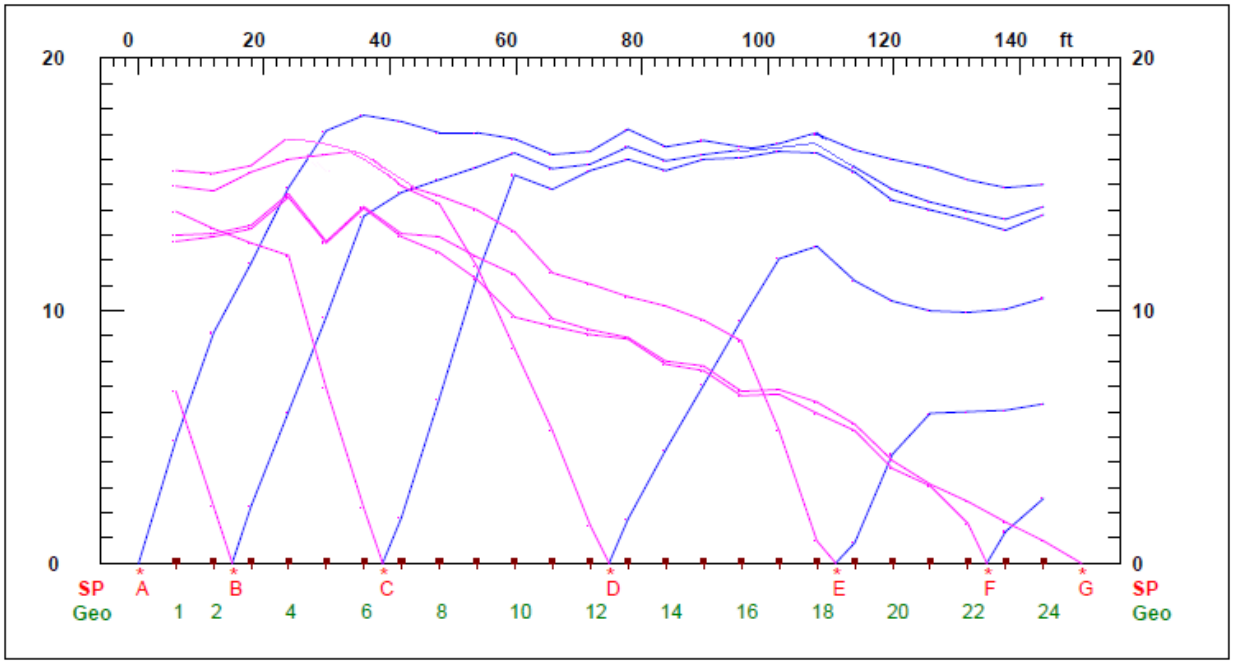
SEISMIC LINE S-2

< South - North >

LAYER VELOCITY MODEL



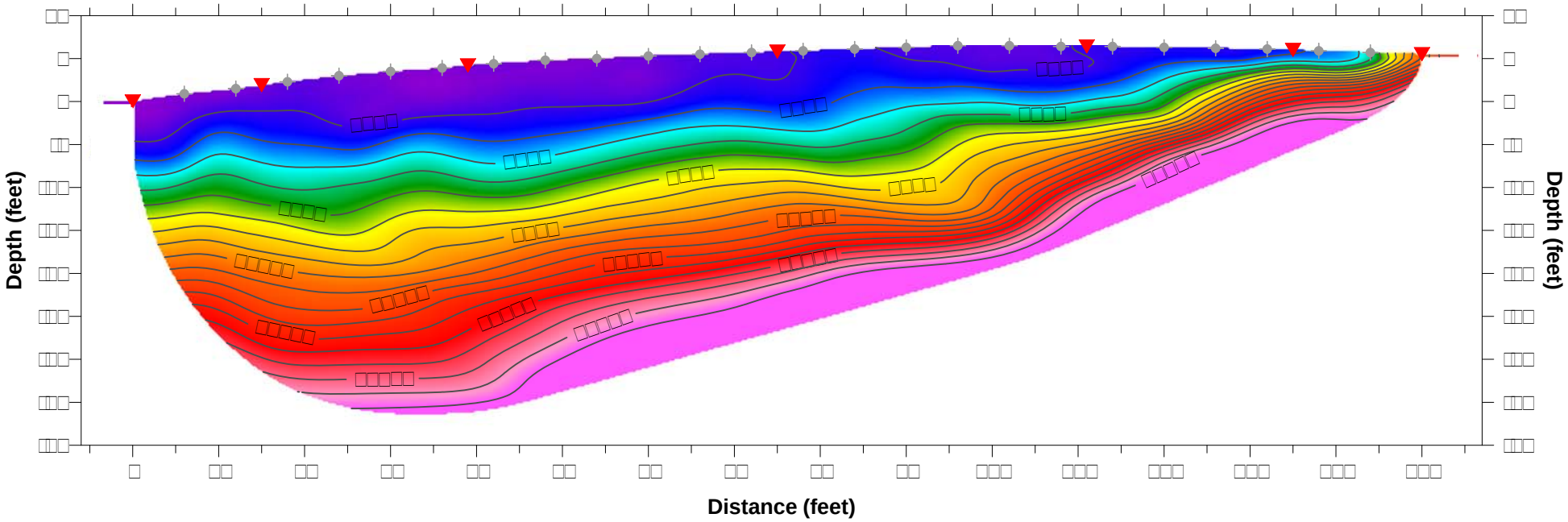
TIME-DISTANCE PLOT



SEISMIC LINE S-2

← South - North →

REFRACTION TOMOGRAPHIC MODEL



Seismic Source

Geophone Receiver

P-Wave Velocity (feet/second)

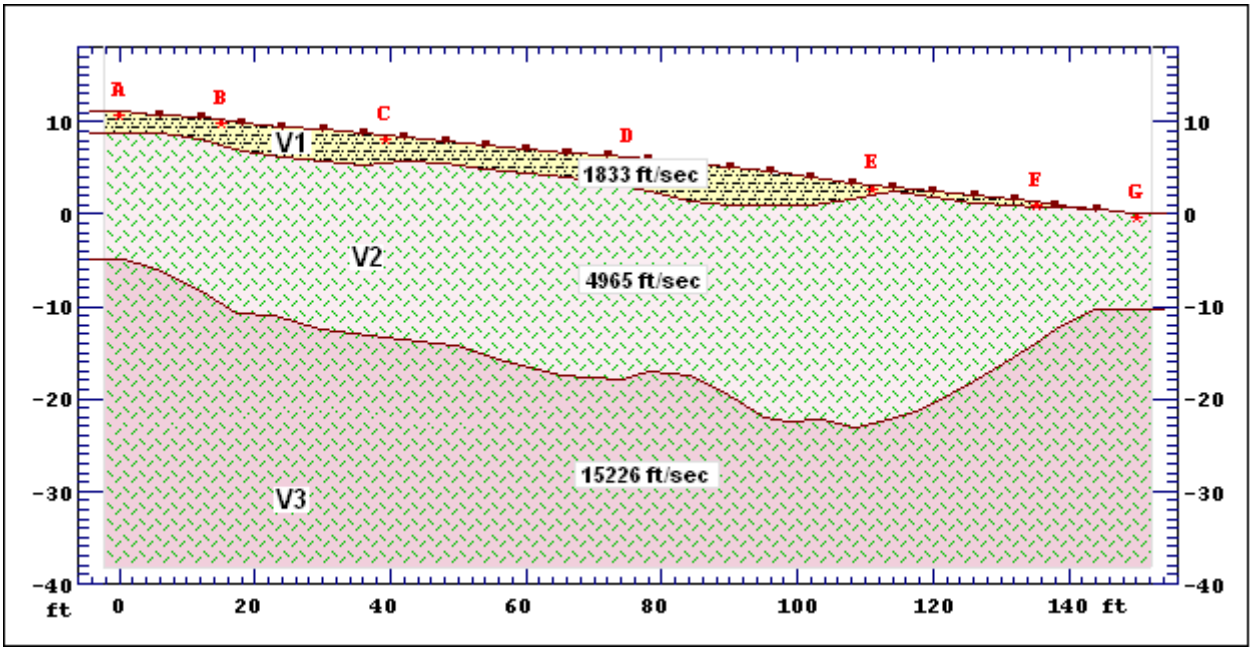
SCALE: 1" = 18' (Horizontal & Vertical)

RMS error 2.9 %, Rayfract Version 3.33

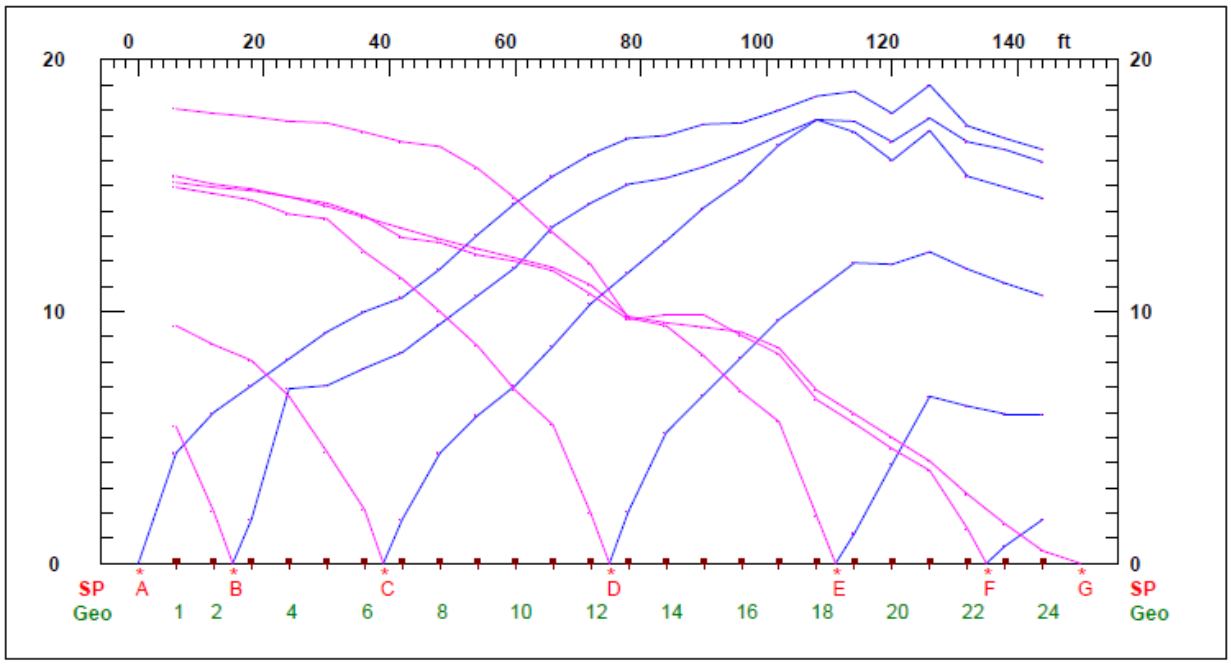
SEISMIC LINE S-3

< South - North >

LAYER VELOCITY MODEL



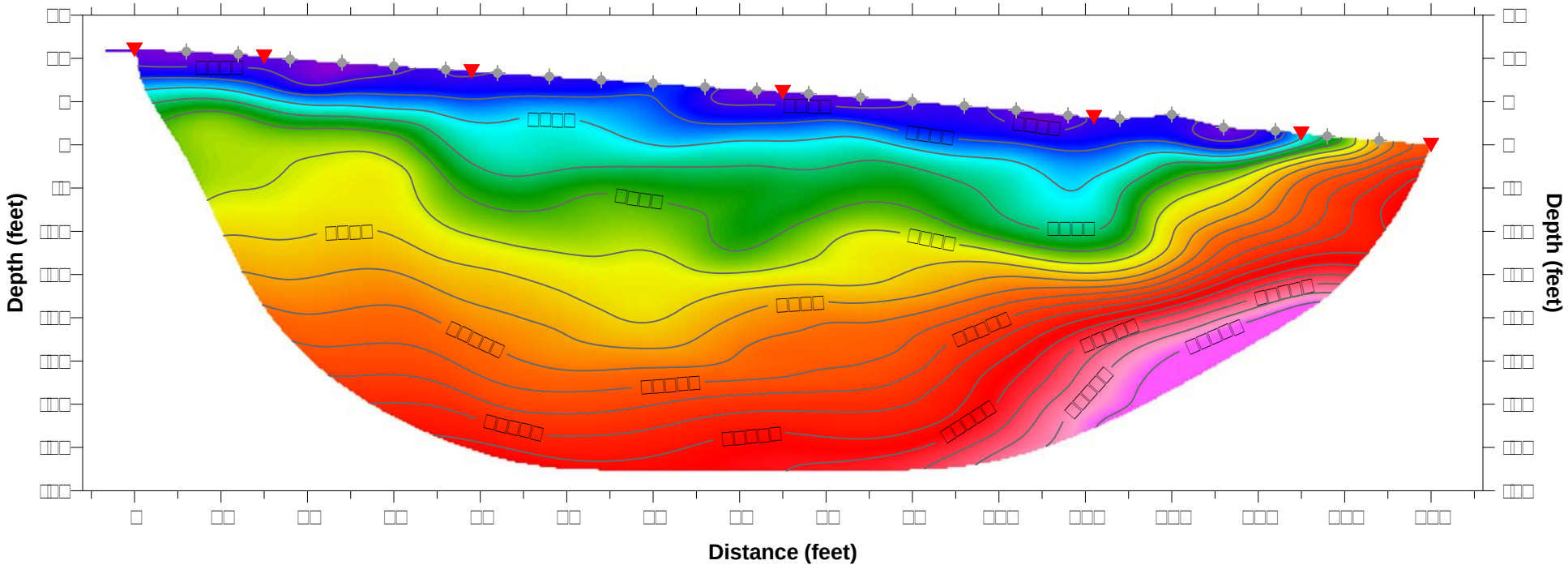
TIME-DISTANCE PLOT



SEISMIC LINE S-3

← South - North →

REFRACTION TOMOGRAPHIC MODEL



▼ Seismic Source

✦ Geophone Receiver

P-Wave Velocity (feet/second)

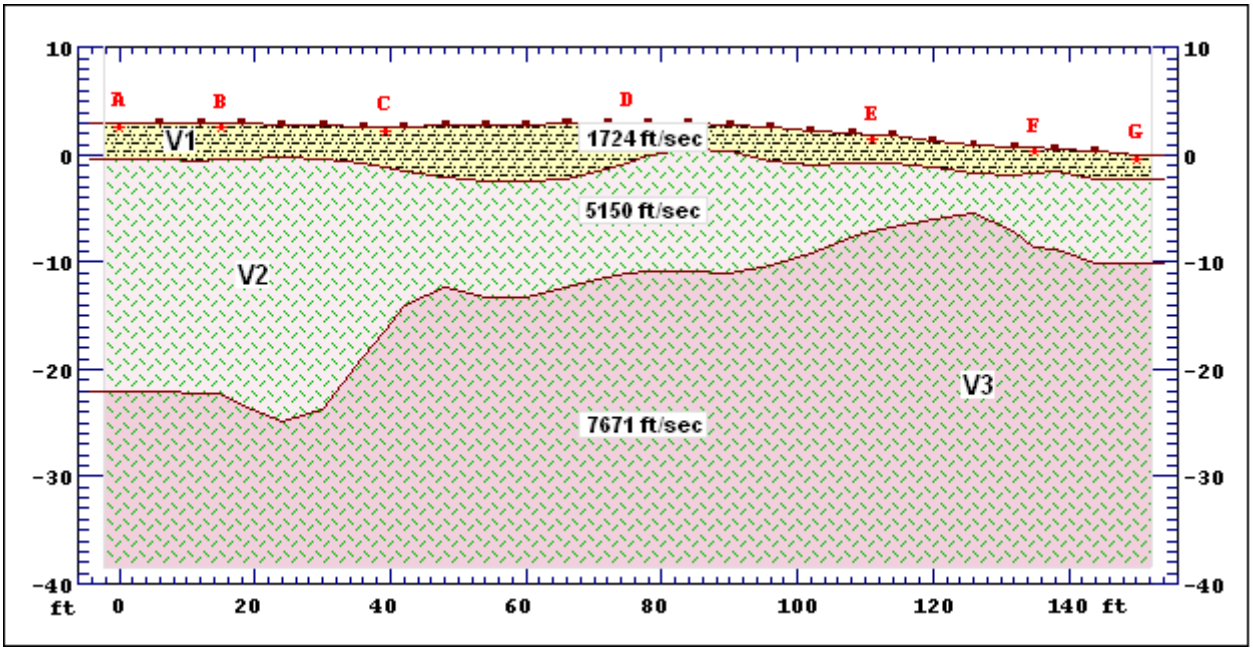
SCALE: 1" = 18' (Horizontal & Vertical)

RMS error 2.4 %, Rayfract Version 3.33

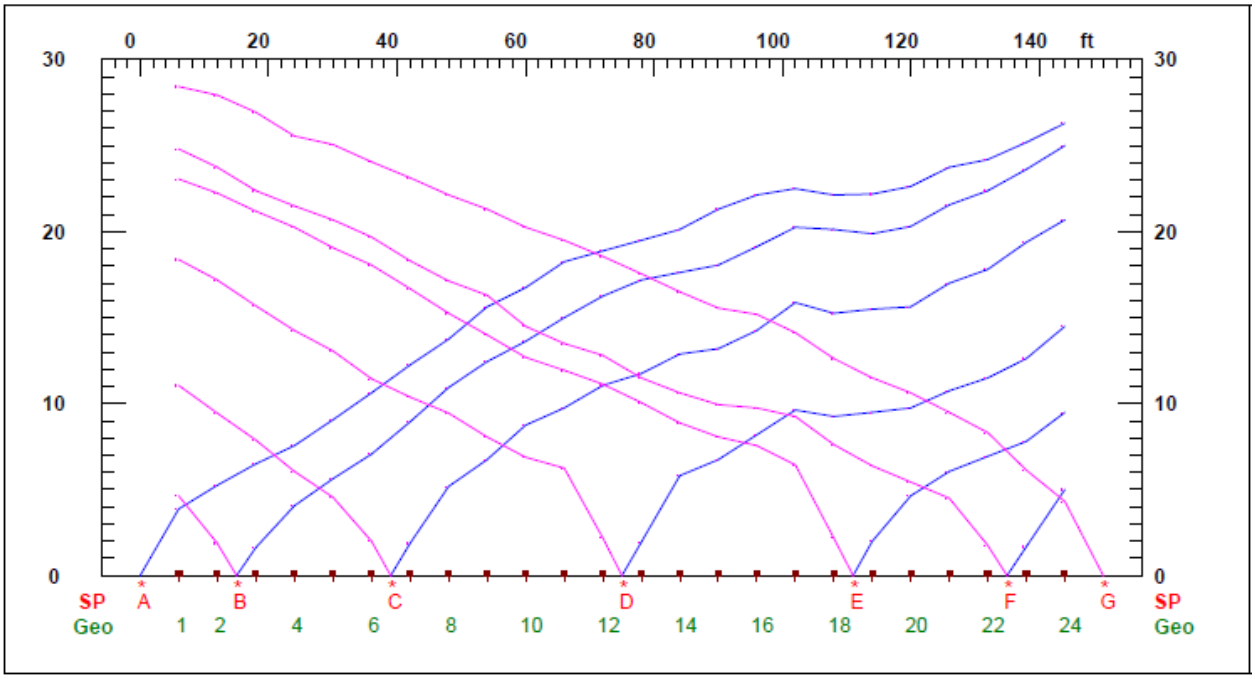
SEISMIC LINE S-4

< West - East >

LAYER VELOCITY MODEL



TIME-DISTANCE PLOT



Additionally, as presented below on Figure 1, the Caterpillar D9R Ripper Performance Chart (Caterpillar, 2012) has been provided for reference.

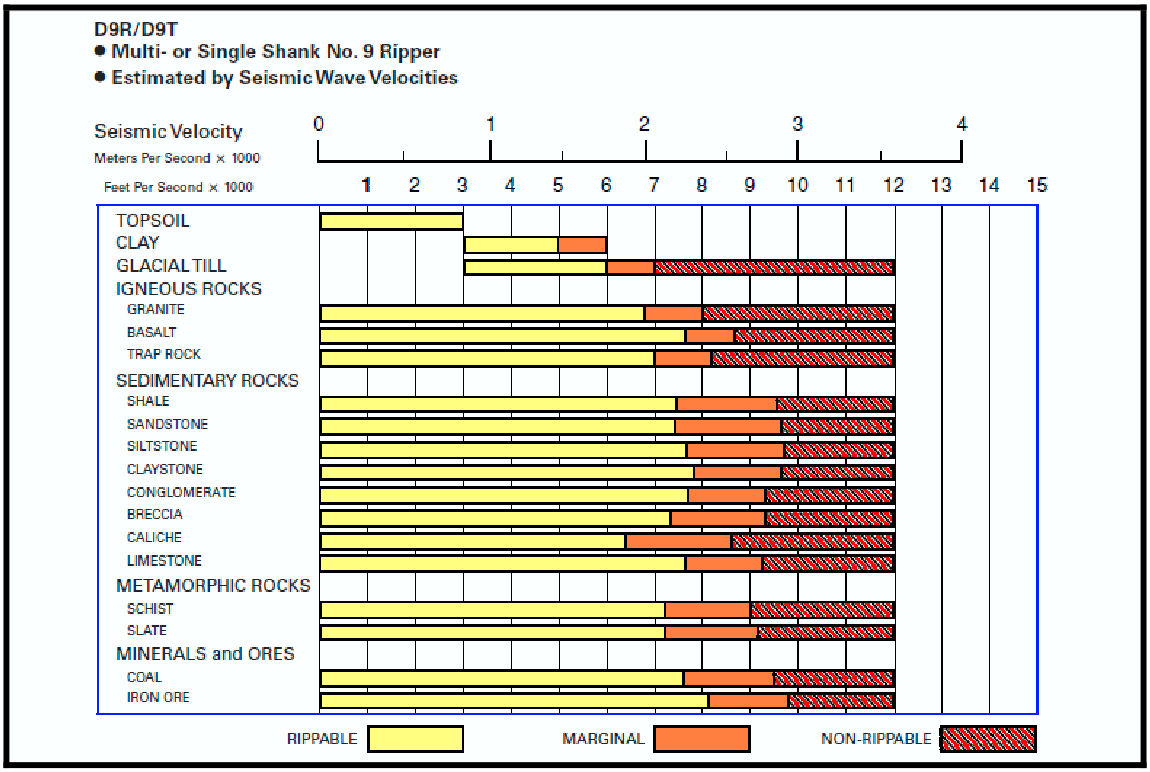
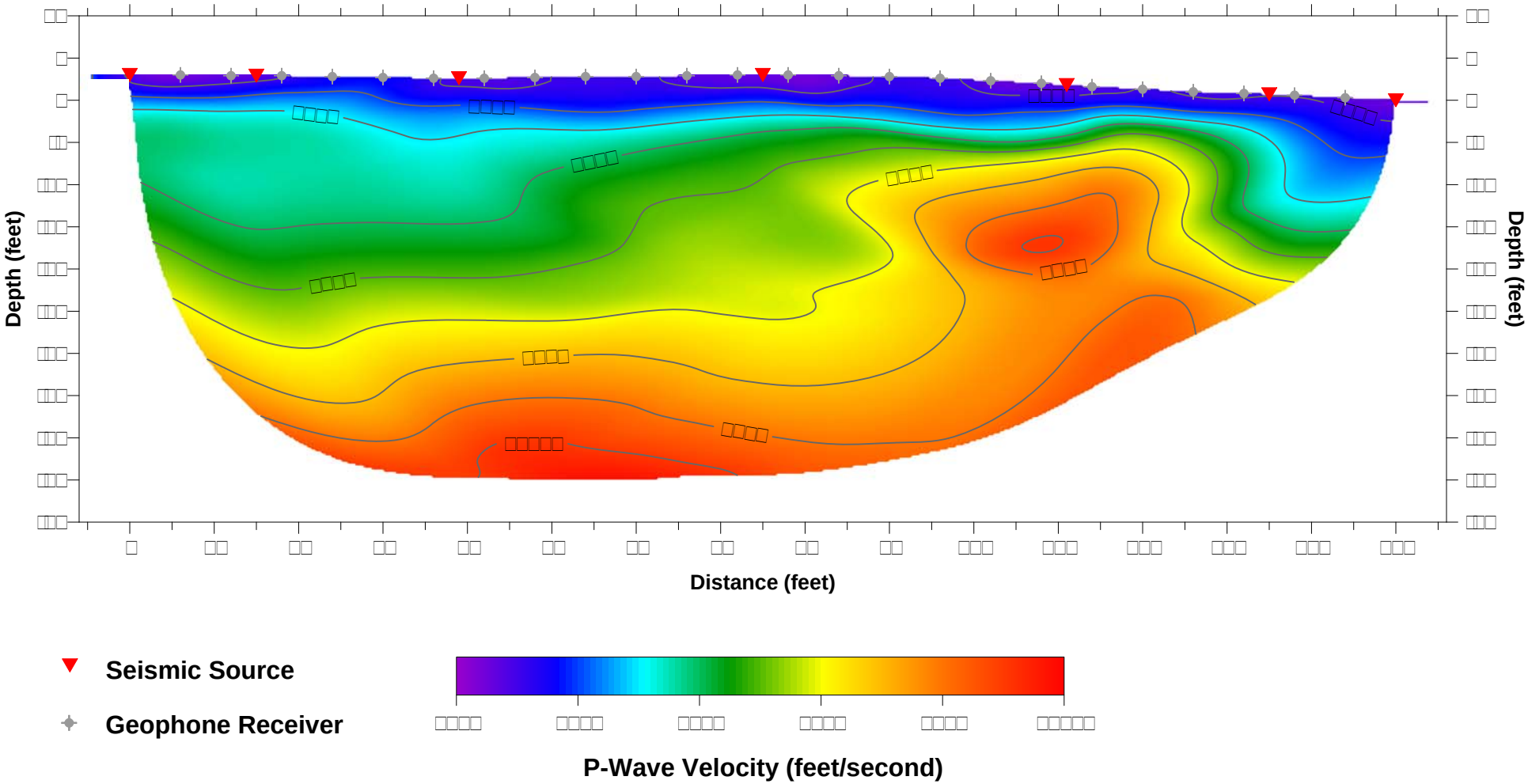


FIGURE 1- Caterpillar D9R Ripper Performance Chart

SEISMIC LINE S-4

← East - West →

REFRACTION TOMOGRAPHIC MODEL



SCALE: 1" = 18' (Horizontal & Vertical)

RMS error 1.5 %, Rayfract Version 3.33

APPENDIX B

Generalized Rippability Characteristic of Bedrock

GENERALIZED RIPPABILITY CHARACTERISTICS OF BEDROCK

A summary of the generalized rippability characteristics of bedrock based on a compilation of rippability performance charts prepared by Caterpillar, Inc. (2004), Caltrans (Stephens, 1978), and Santi (2006), has been provided to aid in evaluating potential excavation difficulties with respect to the seismic velocities obtained along the local areas surveyed. These seismic velocity ranges and rippability potentials have been tabulated below for reference.

TABLE 1- CATERPILLAR RIPPABILITY CHART (D9 Ripper)

Granitic Rock Velocity	Rippability
< 6,800	Rippable
6,800 – 8,000	Moderately Rippable
> 8,000	Non-Rippable

Additionally, we have provided the Caltrans Rippability Chart as presented below within Table 2 for comparison. These values are from published Caltrans studies (Stephens, 1978) that are based on their experience which are more conservative than Caterpillar's rippability charts. It should be noted that the type of bedrock was not indicated.

TABLE 2- STANDARD CALTRANS RIPPABILITY CHART

Velocity (feet/sec ±)	Rippability
< 3,500	Easily Ripped
3,500 – 5,000	Moderately Difficult
5,000 – 6,600	Difficult Ripping / Light Blasting
> 6,600	Blasting Required

Table 3 is partially modified from the "Engineering Behavior from Weathering Grade" as presented by Santi (2006), which also provides velocity ranges with respect to rippability potentials, along with other rock engineering properties that may be pertinent.

TABLE 3- SUMMARY OF ROCK ENGINEERING PROPERTIES

ENGINEERING PROPERTY:	Slightly Weathered	Moderately Weathered	Highly Weathered	Completely Weathered
Excavatability	Blasting necessary	Blasting to rippable	Generally rippable	Rippable
Slope Stability	½ :1 to 1:1 (H:V)	1:1 (H:V)	1:1 to 1.5:1 (H:V)	1.5:1 to 2:1 (H:V)
Schmidt Hammer Value	51 – 56	37 – 48	12 – 21	5 – 20
Seismic Velocity (fps)	8,200 – 13,125	5,000 – 10,000	3,300 – 6,600	1,650 – 3,300

APPENDIX B

LOGS OF EXPLORATORY TRENCHES BY GEOTEK

Updated Geotechnical Evaluation
Proposed Single-Family Residential Development
Woodcrest, Riverside County, California
Project No. 2855-CR

GEOTEK

A - FIELD TESTING AND SAMPLING PROCEDURES

Bulk Samples (Large)
These samples are normally large bags of earth materials over 20 pounds in weight collected from the field by means of hand digging or exploratory cuttings.

Bulk Samples (Small)
These are plastic bag samples which are normally airtight and contain less than 5 pounds in weight of earth materials collected from the field by means of hand digging or exploratory cuttings. These samples are primarily used for determining natural moisture content and classification indices.

B – TRENCH LOG LEGEND

The following abbreviations and symbols often appear in the classification and description of soil and rock on the logs of trenches:

SOILS

USCS	Unified Soil Classification System
f-c	Fine to coarse
f-m	Fine to medium

GEOLOGIC

B: Attitudes	Bedding: strike/dip
J: Attitudes	Joint: strike/dip
C: Contact line	
……..	Dashed line denotes USCS material change
———	Solid Line denotes unit / formational change
———	Thick solid line denotes end of the trench

(Additional denotations and symbols are provided on the logs of trenches)

GeoTek, Inc.

LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	**TRENCH NO.: T-1** / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Rel. Comp. (%)	Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty m-c SAND with some clay, light brown, slightly moist				
				Alluvium				
			SC	Clayey m-c SAND, red-brown, very moist				
5				**Granitic Bedrock** Tonalite, red-yellow, slightly moist, relatively easy to excavate - Becomes hard to excavate, 2-3 scratches for 1/4 bucket				
10				**TRENCH TERMINATED AT 10 FEET DUE TO REFUSAL** No groundwater encountered Trench backfilled with soil cuttings				
15								

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	TRENCH NO.: T-2 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Rel. Comp. (%)	Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty m-c SAND with some clay, light brown, slightly moist, some pvc pipe				
				Alluvium				
			SM	Silty m-c SAND with some clay, light brown, moist, some granite fragments				
				Granitic Bedrock				
				Tonalite, excavates as m-c SAND, moist, yellowish tan, relatively easy to excavate				
5				-Becomes gray @ 5.0 feet				
10								
				TRENCH TERMINATED AT 13 FEET				
				No groundwater encountered				
15				Trench backfilled with soil cuttings				

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

TRENCH NO.: T-3

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Rel. Comp. (%)	Laboratory Testing: Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f SAND, light brown, slightly moist, loose, some rootlets				
	X			**Alluvium**				Expansion Index = 17
			ML	Sandy SILT with some clay, red-brown, moist to very moist				Corrosion Testing
								Remolded Shear Test
								Maximum Density Test
				Granitic Bedrock				
				Tonalite, excavates as m-c sand, yellowish tan, relatively easy to excavate				
5								
				- Becomes medium hard to excavate, 2-3 scratches for 1/2 bucket				
10								
				TRENCH TERMINATED AT 10.5 FEET				
				No groundwater encountered				
				Trench backfilled with soil cuttings				
15								

LEGEND

Sample type: ---Ring; ---Large Bulk; ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

TRENCH NO.: T-4

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Rel. Comp. (%)	Laboratory Testing: Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f SAND, light brown, dry to slightly moist, loose, some rootlets				
				Alluvium				
			SM	Silty f SAND, brown, moist, some rootlets				
				Granitic Bedrock				
				Tonalite, excavates as m-c sand, orange black, easy to medium hard to excavate				
5								
10								
				TRENCH TERMINATED AT 14.0 FEET				
15				No groundwater encountered Trench backfilled with soil cuttings				

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	TRENCH NO.: T-5 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Rel. Comp. (%)	Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f SAND, light brown, dry to slightly moist, loose, some rootlets				
				Alluvium				
			SM	Silty f SAND, brown, moist, some rootlets				
			SP	F-m SAND with some silt and clay, moderate brown, very moist				
5		▽		**Granitic Bedrock** Tonalite, excavates as m-c sand, black-gray, Relatively easy to excavate				
10				**TRENCH TERMINATED AT 8.0 FEET** Groundwater encountered at 6.5 feet Trench backfilled with soil cuttings				
15								

LEGEND

Sample type: ---Ring ---Large Bulk ▽ ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.

LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	TRENCH NO.: T-6 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Rel. Comp. (%)	Laboratory Testing: Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f-m SAND with some clay, light brown, slightly moist, some rootlets				
				Alluvium				
			SM	Silty f-m SAND with some clay, brown, moist, some rootlets				
			SC	Clayey m-c SAND with some granitic fragments, red-brown, moist				
5				**Granitic Bedrock**				
				Tonalite, red-brown, moist, very hard to excavate				
				TRENCH TERMINATED AT 5 FEET DUE TO REFUSAL				
				No groundwater encountered				
				Trench backfilled with soil cuttings				
10								
15								

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	TRENCH NO.: T-7 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Rel. Comp. (%)	Laboratory Testing: Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f-m SAND with some clay, light brown, slightly moist, some rootlets				
				Alluvium				
			SM	Silty f-m SAND with some clay and granite fragments, brown, moist, some rootlets and cobbles				Expansion Index = 0
	X		SC	Clayey m-c SAND, red-brown, very moist				Corrosion Testing
								Remolded Shear Test
								Maximum Density Test
				-Becomes yellowish red-brown				
5				**Granitic Bedrock**				
				Tonalite, yellow-tan, moist, easy to excavate				
				- Becomes hard to excavate, 3 scratches for 1/4 bucket				
10				**TRENCH TERMINATED AT 10.5 FEET**				
				No groundwater encountered				
				Trench backfilled with soil cuttings				
15								

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

TRENCH NO.: T-8

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Laboratory Testing: Dry Density (pcf)	Laboratory Testing: Rel. Comp. (%)	Laboratory Testing: Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f SAND, light brown, dry to slightly moist, loose, some rootlets				
				Alluvium				
			SC	Clayey f-m SAND with some silt, red-brown, moist				
				Granitic Bedrock				
				Tonalite, excavates as m-c sand, yellowish tan, easy to excavate				
5				- Becomes hard to excavate, 2-3 scratches for 1/4 bucket				
				TRENCH TERMINATED AT 7.0 FEET DUE TO REFUSAL				
				No groundwater encountered				
				Trench backfilled with soil cuttings				
10								
15								

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

GeoTek, Inc.
LOG OF EXPLORATORY TRENCH

CLIENT:	TTLC Management Inc., An Arizona Corp.	**LOGGED BY:**	DA
PROJECT NAME:	Proposed Single-Family Residential Development	**EQUIPMENT:**	Backhoe
PROJECT NO.:	2855-CR	**DATE:**	8/30/2021
LOCATION:	Woodcrest, CA		

Depth (ft)	SAMPLES: Sample Type	SAMPLES: DCP Blow Count	USCS Symbol	TRENCH NO.: T-9 / MATERIAL DESCRIPTION AND COMMENTS	Laboratory Testing: Water Content (%)	Dry Density (pcf)	Rel. Comp. (%)	Others
				Disturbed Soil/Undocumented Fill				
			SM	Silty f SAND, light brown, dry to slightly moist, loose, some rootlets				
				Alluvium				
			SM-SC	Silty f SAND with clay, red-brown, moist				
				Granitic Bedrock				
				Tonalite, excavates as m-c sand, black-orange, easy to excavate				
5								
10				**TRENCH TERMINATED AT 10.0 FEET**				
				No groundwater encountered				
				Trench backfilled with soil cuttings				
15								

LEGEND

Sample type: ---Ring ---Large Bulk ---Water Table

Lab testing: ND = Nuclear Density Test; EI = Expansion Index; SA = Sieve Analysis; RV = R-Value Test; SR = Sulfate/Resisitivity Test; SH = Shear Test; HC= Consolidation; MD = Maximum Density

APPENDIX C

LABORATORY TEST RESULTS BY GEOTEK

Updated Geotechnical Evaluation
Proposed Single-Family Residential Development
Woodcrest, Riverside County, California
Project No. 2855-CR

GEOTEK

SUMMARY OF LABORATORY TESTING

Direct Shear

Shear testing was performed in a direct shear machine of the strain-control type in general accordance with ASTM D 3080 test procedures. The rate of deformation was approximately 0.035 inch per minute. The sample was sheared under varying confining loads in order to determine the coulomb shear strength parameters, angle of internal friction and cohesion. The tests were performed on soil samples remolded to approximately 90 percent of maximum dry density as determined by ASTM D 1557 test procedures. The shear test results are presented in Appendix C.

Expansion Index

Expansion Index testing was performed on two soil samples. Testing was performed in general accordance with ASTM Test Method D 4829. The results of the testing are provided below and in Appendix C.

Trench No.	Depth (ft.)	Description	Expansion Index	Classification
T-3	1-2	Sandy Silt with Clay	17	Very Low
T-7	2-3	Silty Sand with Clay	0	Very Low

Moisture-Density Relationship

Laboratory testing was performed on two samples collected during the subsurface exploration. The laboratory maximum dry density and optimum moisture content for the soil type was determined in general accordance with ASTM Test D 1557 test procedures. The results of the testing are provided in Appendix C.

Sulfate Content, Resistivity and Chloride Content

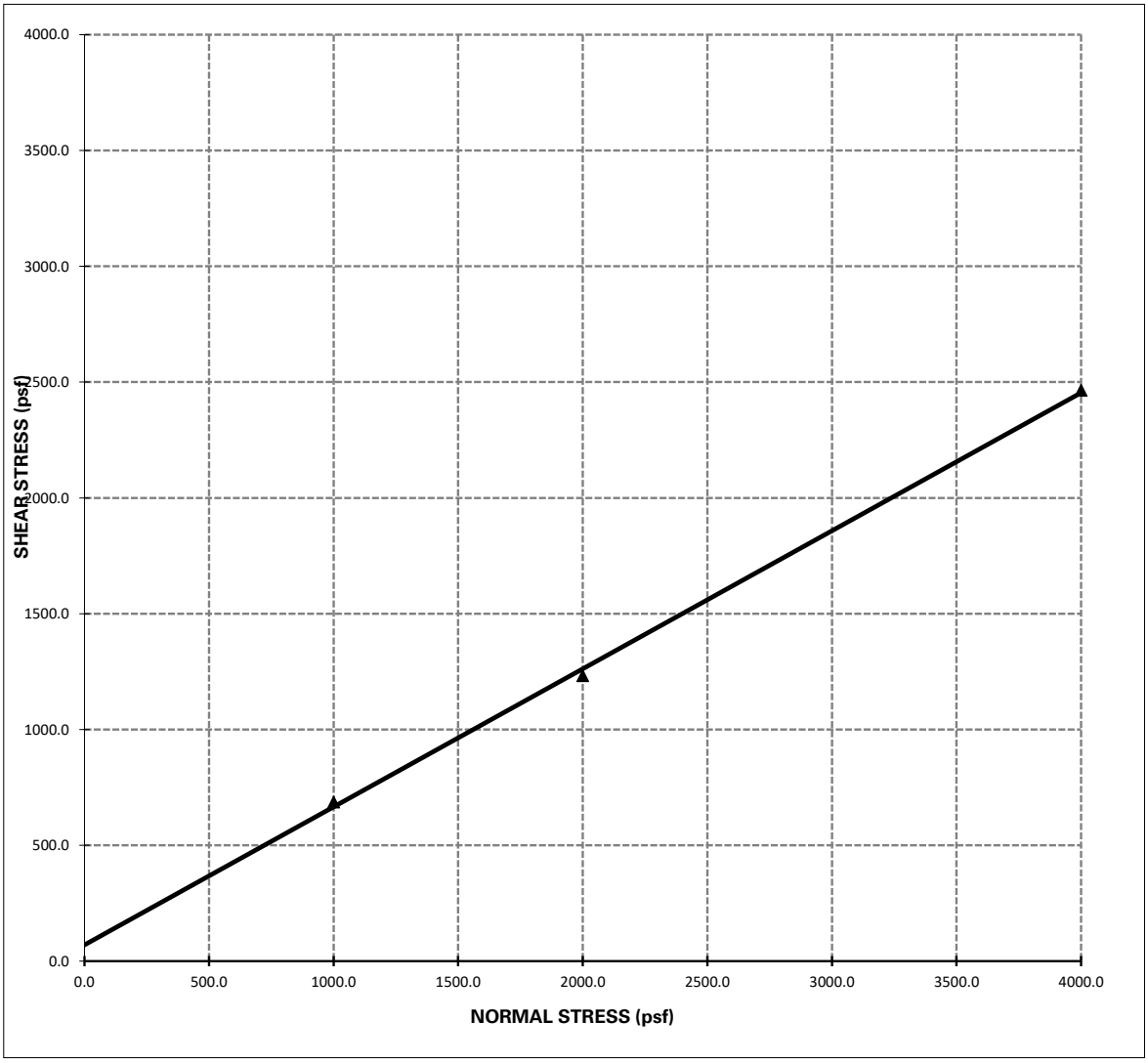
Testing to determine the water-soluble sulfate content was performed by others in general accordance with ASTM D4327 test procedures. Resistivity testing was completed by others in general accordance with ASTM G187 test procedures. Testing to determine the chloride content was performed by others in general accordance with ASTM D4327 test procedures. The results of the testing are provided below and in Appendix B.

Trench No.	Depth (ft.)	pH ASTM D4972	Chloride ASTM D4327 (mg/kg)	Sulfate ASTM D4327 (% by weight)	Resistivity ASTM G187 (ohm-cm)
T-3	1-2	7.7	135.9	0.0278	804
T-7	2-3	8.3	15.5	0.0047	3,685

DIRECT SHEAR TEST

Project Name:	The True Life Comapanies	***Sample Location:***	T3 @ 1-2'
Project Number:	2855-CR	***Date Tested:***	9/15/2021

PEAK VALUE



Shear Strength: Φ = **31°** **C = 70 psf**

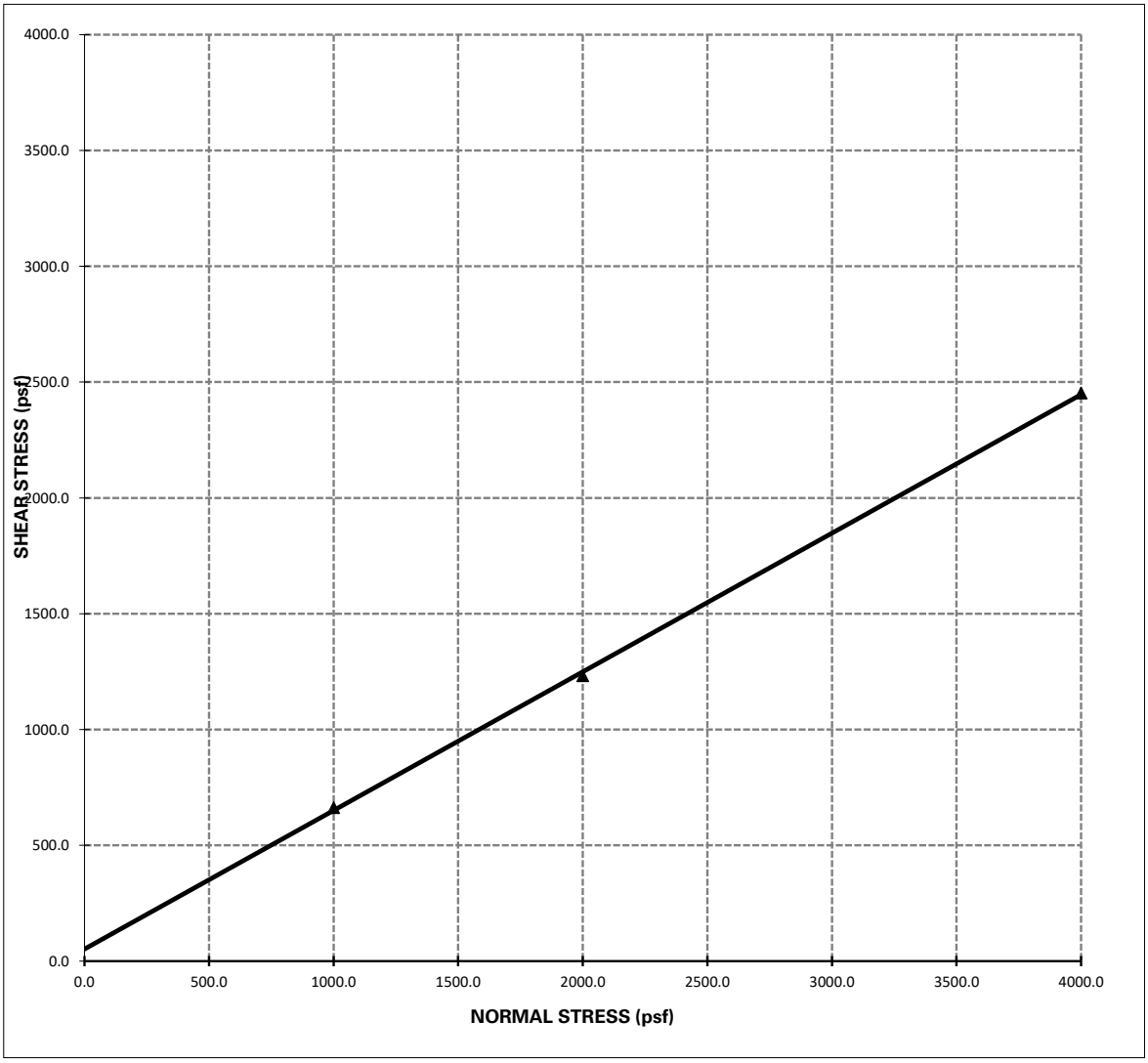
Notes: 1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.

2 - The above reflect direct shear strength at saturated conditions.

3 - The tests were run at a shear rate of 0.035 in/min.

DIRECT SHEAR TEST

Project Name:	The True Life Comapanies	***Sample Location:***	T3 @ 1-2'
Project Number:	2855-CR	***Date Tested:***	9/15/2021



Shear Strength: Φ = **31°** **C = 52 psf**

Notes: 1 - The soil specimen used in the shear box was a ring sample remolded to approximately 90% relative compaction from a bulk sample collected during the field investigation.

2 - The above reflect direct shear strength at saturated conditions.

3 - The tests were run at a shear rate of 0.035 in/min.